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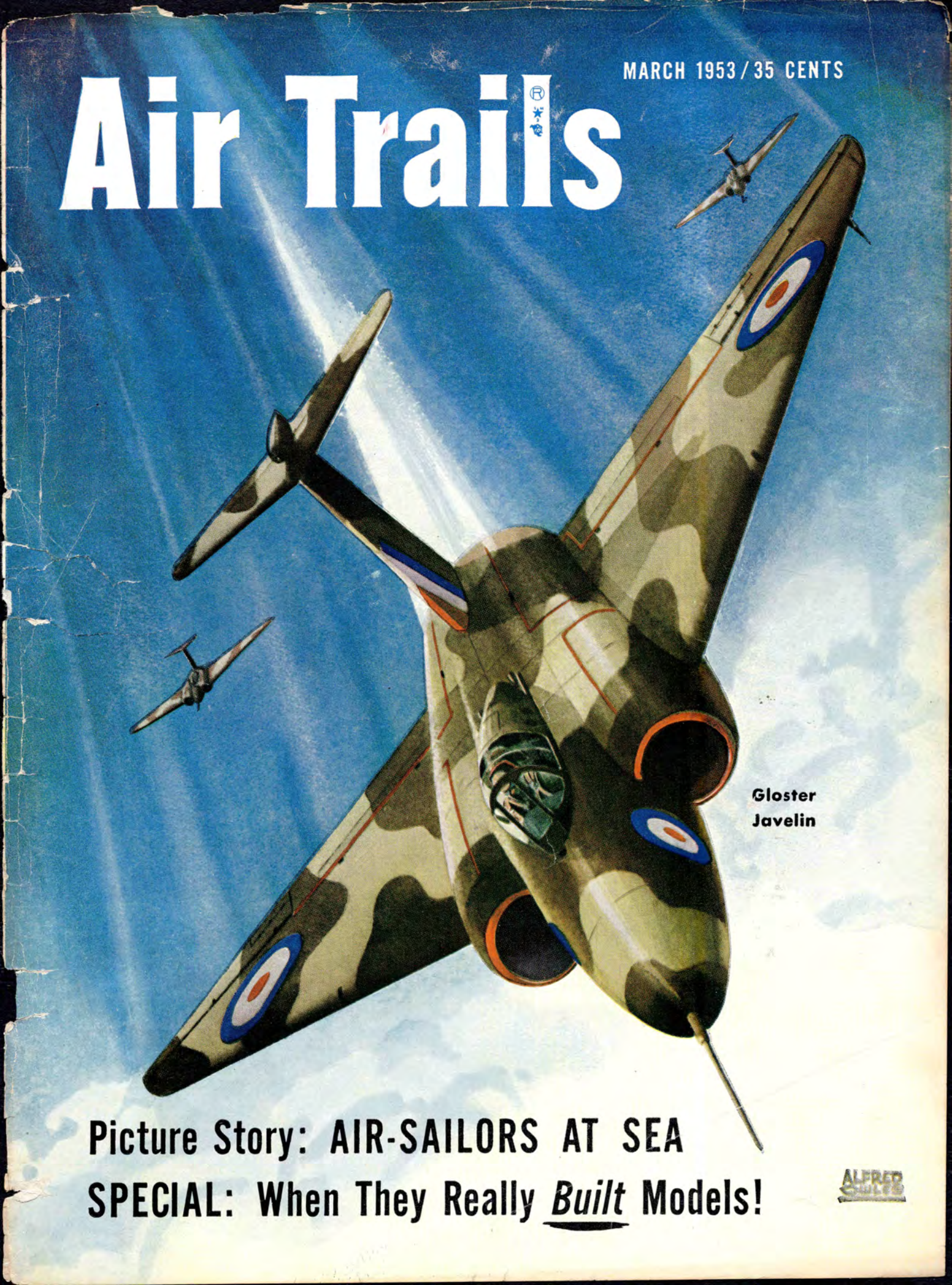

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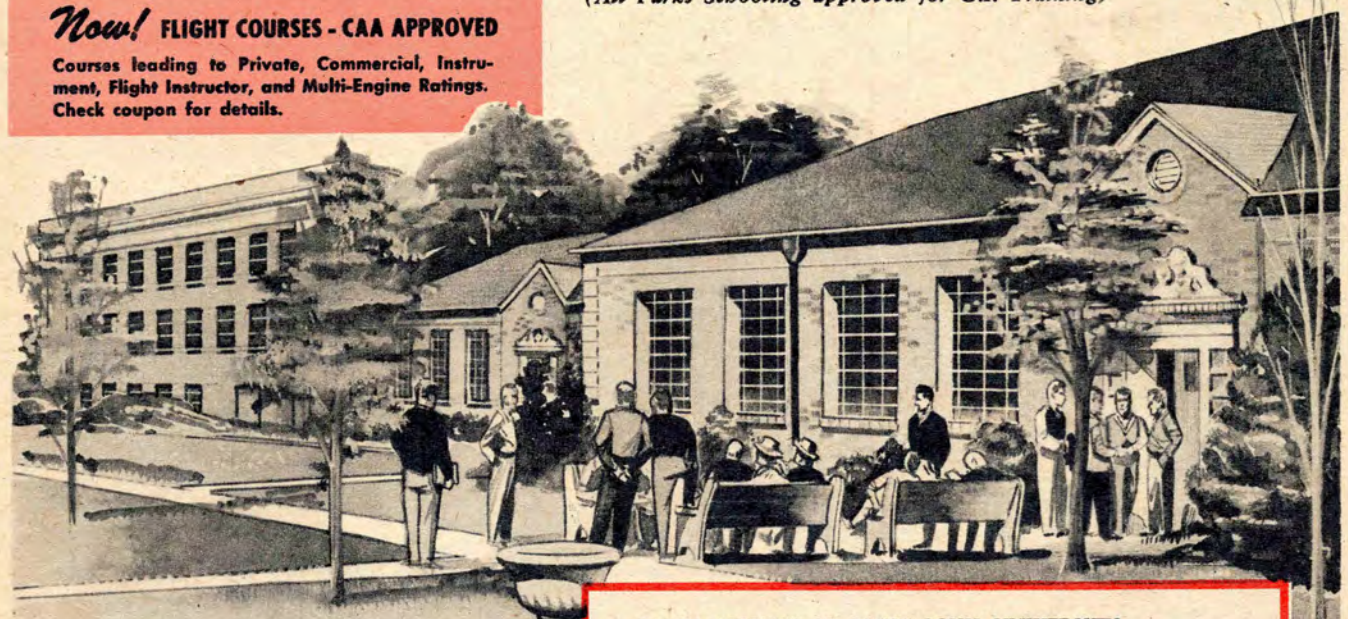

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FROM THE READER

"Full Size Plan" Mailbag . . . Each month I wait in line at the P.X. for my copy of Air Trails but last month I was on maneuvers when it came out, and my "stand-in" at the P.X. was sent to the hospital. Result? *No* Air Trails! For months I've been looking for L-19 plans, without success, and have even started to scale up some plans from Tech Order drawings. So you can see it's a double disappointment to miss the October Issue with L-19 plans in it. I've even put a notice on the Bulletin Board offering $1.00 for a used Oct. issue of Air Trails, but no dice!

1st Lt. Lionel E. Chase, Europe

● Along with this heart-rending story, Lt. Chase sent in the usual fee for plans of the L-19 and other planes for model building. We wish to report, for the benefit of those whose reaction was a loud "Oh, no!" (as was ours), that said plans were sent immediately.

. . . I have found your plans very satisfactory in the past, particularly the T-6 (ATA 522), which I built in two versions, one as a gas model and one as a scale model with controls movable from the cockpit for use in demonstration of the various attitudes of flight to my students.

I have found the second model to be invaluable in instructing since it gives the student a clear picture of the attitude of the plane in all maneuvers, including the position of the controls. I might add that I am an instructor in the USAF and am stationed at Vance Air Force Base, Oklahoma.

I have been a reader of your fine magazine for as long as I can remember, since the days when it featured Bill Barnes and his crew. My only regret is that I failed to save those copies (Bill Barnes) and I have wished, and watched hopefully, for someone to advertise the sale of same.

Capt. Foley D. Collins, Jr., USAFR, Enid, Okla.

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All of above are ¼" to the foot scale, and on the average pretty well detailed. 10 cents each, postpaid.

We find we also still have other "oldies," like the Boeing B-17, Curtiss C-46 Commando, and F. W. Kurier. All three are ¼" scale. Plus two rubber-powered jobs, the P-47 and P-50 (30" span each). And to make it an even half dozen on large plans, we have some P-40 U-control plans (36" span). Any three for 50 cents on this group.

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● Through Aircraft Plan Co., full-size working drawings of flying scale model plans were marketed for quite some time. There is a limited supply of some plans as outlined. If interested, better act quick.

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Dallas B. Sherman, Tokyo, Japan

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BURIED IN THIS AD
are most of the new items. Sometimes there isn't time or space to include them. But, if available, we have it.

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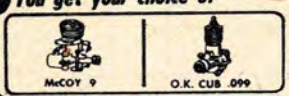
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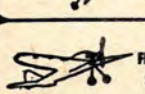
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Air Notes

Sabre's almost 700 mph sets new record

NEW WORLD SPEED RECORD of close to 700 mph established by AF's Captain J. Slade Nash over three-kilometer course (1⅞ miles) at Salton Sea, Calif. Captain Slade flew a North American F-86D all-weather interceptor. To conform with F.A.I. regulations for international recognition, four passes were made over the course. 699 mph represents average of the three runs. Best speed was 703 mph. . . . NAVY'S and world's first delta wing seaplane, the Consolidated-Vultee XF2Y-1 "Sea Dart," began its pre-flight trial runs at San Diego, Calif. Plane is equipped with hydro-skis, powered by jet engines. . . . UNIVERSITY OF ILLINOIS has flight-trained in the last six years 1850 students without a single injury. Training involved 66,814 flying hours.

★ ★ ★

MIDGET RACING enthusiasts will be interested to know that complete, full-size construction plans for 190 cu. in. displacement racer are available now from Lazor & Rautenstrauch, Box 38, Durham, Conn. This team built the well-known #76, "Belle of Bethany," a beautifully finished midget which participated in a number of races. Also available are good size three-views and photo for two bucks. Plans follow closely the general shape of the "Belle," but the name has been changed; it's "Pogo" now.

★ ★ ★

REPUBLIC'S radical inverse taper, jet and rocket interceptor, the XF-91, exceeded speed of sound during regular flight tests at Edwards AFB, Muroc, Calif. Both the 5200 lb. thrust J-47 jet engine and the 6000 lb. thrust Reaction Motors rocket were used for the supersonic run. At the controls was Republic's Russel "Rusty" Roth. . . . SIX MILLION passengers and 40,500,000 lbs. of mail will be transported by helicopters in the New York area every year by 1975, according to the Port of New York Authority. Ten- to thirty-place helicabs will be used.

★ ★ ★

LANDING planes diagonally across an aircraft carrier deck will be tested by the Navy as soon as suitable modifications are made to the *USS Antietam*, an Essex class carrier. Planes will land in an area angled eight to ten degrees to the left of the center line of the main flight deck. New system eliminates danger of planes leaping arresting barrier and crashing into parked aircraft, and allows pilot to take off again after a missed landing.

★ ★ ★

JOHN K. NORTHROP, president and founder of Northrop Aircraft Inc., builders of F-89 Scorpion, announced his retirement from aeronautical field due to ill health. At the same time Northrop Aircraft denied rumors that Air Force has canceled the contract for the F-89 because of several wing failures which occurred recently. Certain modifications are being made on the wing fittings of the Scorpions to eliminate trouble. . . . TRANS CANADIAN AIRLINES have placed an order for fifteen Vickers Viscount turboprop airliners.

★ ★ ★

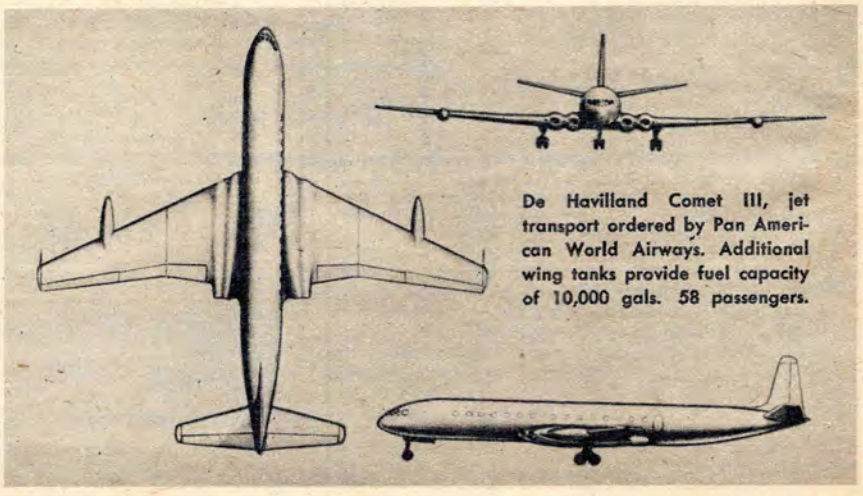
ONE HUNDRED AND SIXTY-FOUR AIRCRAFT described, with 278 illustrations including three-views and wealth of general interest information is contents of "The Observer's Book of Aircraft" by William Green and Gerald Pollinger. Price $1.50; Frederick Warne & Co., 79 Madison Ave., New York, N. Y.

★ ★ ★

A BUCK APIECE is the price of four books by Major C. B. COLBY, C.A.P., entitled. "Jets of the World," "Wings of Our Navy," "Wings of Our Air Force" and "Arms of Our Fighting Men." Large full-page photos of aircraft, guns and tanks with detailed description, between hard, color-photo covers. Published by Coward-McCann Inc., 210 Madison Ave., New York, N. Y.

★ ★ ★

DOUGLAS A3D, 2-jet, swept-wing, carrier-borne attack plane undergoing test flights at Edwards AFB, Muroc, Calif. . . . SPERRY GYROSCOPE CO. took delivery of twin-engine Aero-Commander; plane to be used for testing new flight instruments and other equipment.



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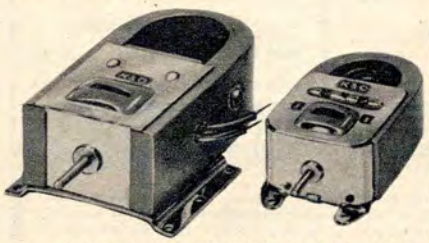

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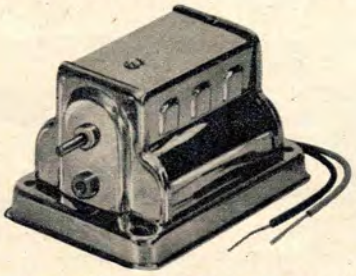

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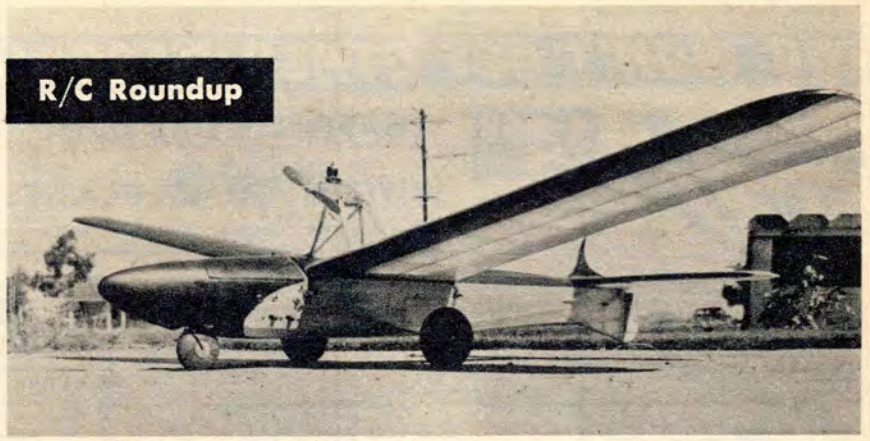


Bill Hittenberger, Redwood City, Calif., has been flying this ship which looks like a powered glider with 64 in. span and 3 lb., 11 oz. weight. Power is Royal Spitfire above wing.

Massachusetts fans develop 3-speed set-up

■ Interest in motor control is growing, and there will be a lot of ships with two-speed in the air. So far, most two-speed flyers employ double needle valves, a system that has been found to work very well. You can also get a nice variable speed action by altering the amount of air allowed to enter the engine. An adaptation of this has been worked out by Lou Andrews, who has used his mostly on small engines like the McCoy 9. The deal is sketched below, with details sent by Al Trefethen. The 1/16" and ⅛" air tubes go to a Bonner motor control escapement, or equivalent. For low speed, only the small tube is open; opening the large tube alone gives medium speed, and if both are open, you have high speed. Make sure that all the joints in the tubing are airtight, and that the escapement valves really close tight when you want them to.

Bill Hittenberger originally had two Spits mounted back to back on his "sail-plane" R/C job, but the combined thrust so high over the wing was too much to allow any climb. One engine gives nice slow climb and smooth turns. The movable part of the rudder is entirely below the stab, to keep it out of the slipstream, so that power and glide turns will be equal.

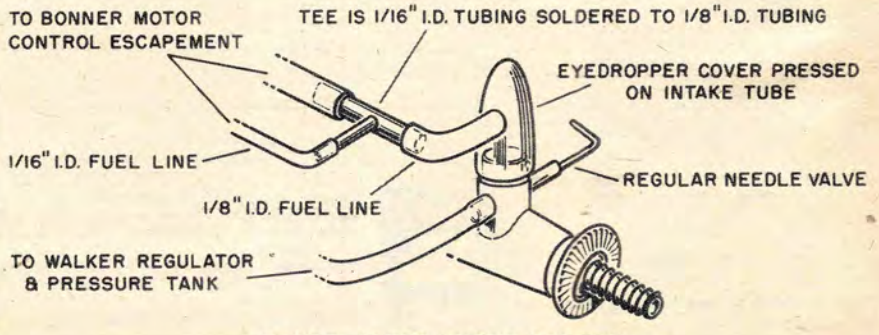
It seems to work very well indeed. Bill's garage is the meeting place for local R/C flyers; six are active so far, but more are always welcome.

Insurance is something a lot of radio flyers have worried about. Our R/C jobs are heavily loaded and they fly—and glide—quite fast. They can do considerable damage, if they come down out of control, of if the operator misjudges. There has been talk in quite a few quarters of some sort of liability insurance to cover such cases; of course, if you are flying in an AMA-sanctioned contest, you are automatically covered for liability. Not so in sport flying, however. And with flying spots getting scarcer and scarcer in many parts of the country, it behooves the R/Cers to consider this problem; it only takes one out-of-control plane going through somebody's picture window—and a flyer who is unable to pay for the resultant damage—for one more good flying spot to be closed up.

Fortunately there is an out for many of us. It is in the form of the "Public Liability Insurance" that quite a few of us already carry. Such insurance protects against injury to persons working for you, also against damage or injury that may result from your participation in sports. Well, R/C flying is certainly a sport. It has been so judged in regard to these insurance policies, in several cases we have heard of. It is wise to get your agent to insert a clause specifically mentioning model flying just so there can be no argument, in case you ever do need such coverage. This insurance doesn't cover loss or damage to your models, of course, but the A.M.A. low-cost insurance takes care of this nicely.

Mailbag. News of a new R/C club comes through Ray Morgan of Patterson, Calif., who writes that the "Aerial Robots" recruit members from the Central San Joaquin Valley. In existence for over a year now, this group has about 15 members, with eight already past the flying stage. So far, aside from Ray who flies ships of his own design, the boys have stuck pretty much to kit R/C planes. Interested flyers may contact Ray at 314 N. 5th Street.

We really enjoyed a flying session last fall at the fine field of the Guided Missiles. near Hadley Air- (*Continued on page* 66)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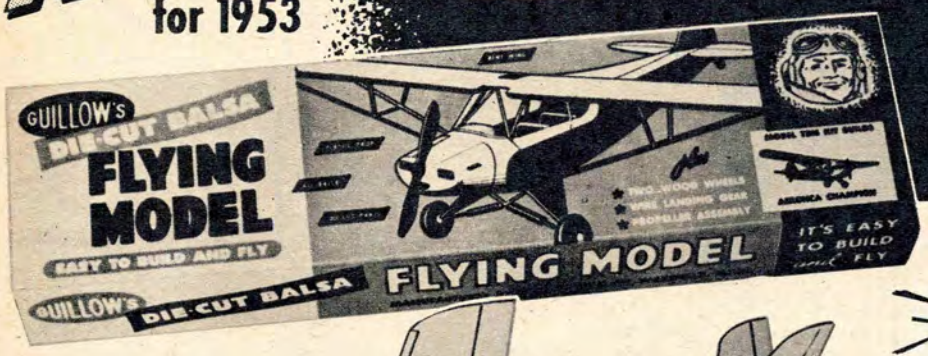

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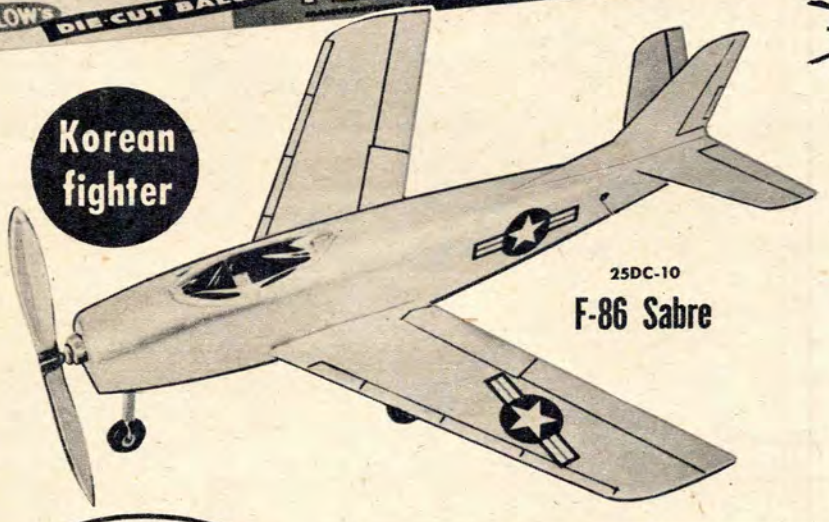
Here is an all military series featuring planes that have been making the headlines — the F-86 Sabre and its arch enemy the Russian Mig-15, the all weather F-89 Scorpion and the ever popular Skyraider and P-51 Mustang.

Korean fighter



25DC-10
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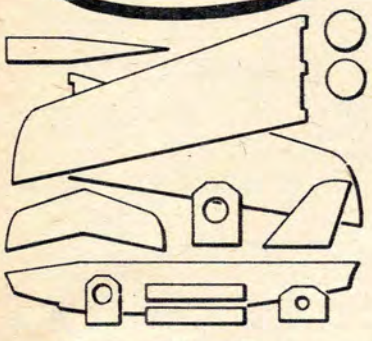
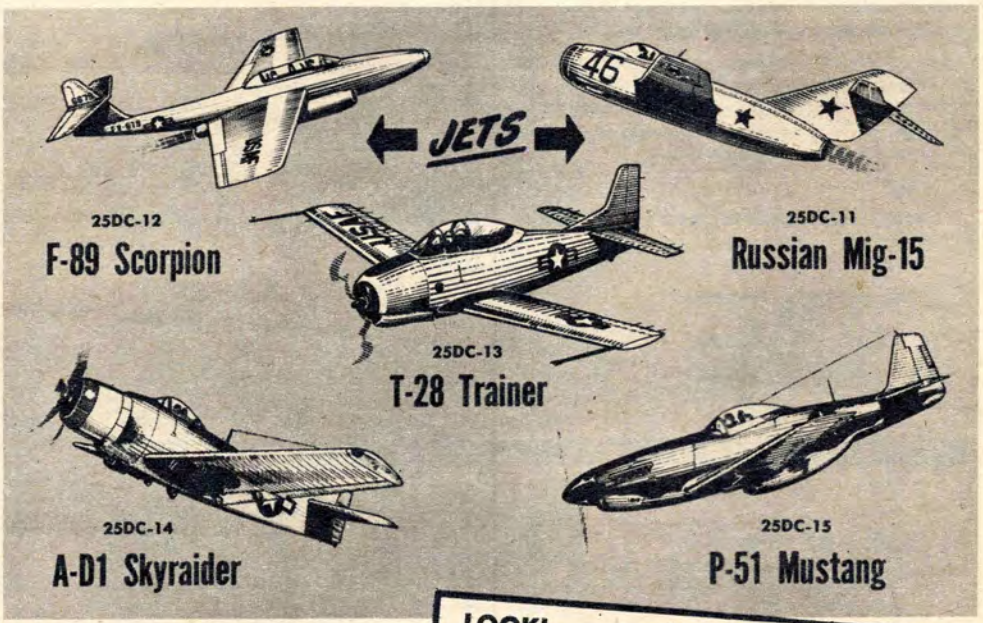


Die-cut Balsa Parts



25DC-12
F-89 Scorpion

25DC-11
Russian Mig-15

25DC-13
T-28 Trainer

25DC-14
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25DC-15
P-51 Mustang

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"AT" FORUM

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Overseas Dope . . . I'm now serving in the U. S. Army Occupation Forces here in Germany. I have asked my parents to send me some model supplies from home as I cannot purchase any over here as I know of. The post office of Kingsport, Tennessee, turned down packages which contained model airplane fuel, dope or Sta-dope, glue, and various other articles which I need to build and fly model planes.

Pvt. Keener Lord, Germany

● We are unable to suggest any way you can have glow fuel and other combustibles shipped through the mail for your model work. Contact Special Services and see what suggestions they have. There is a great deal of modeling going on among the Air Force personnel stationed in Germany. If you could contact someone at an airfield, you might find out how these vital materials are secured where you are.

Balance Point on Flying Wings . . . I have made a flying wing out of the first flying model I built. The engine is an O&R "23." It is not too heavy, but it is nose heavy. I would like to know how to get it to balance without getting it heavy. Is it natural for a flying wing to be nose heavy or not?

Robert Arneson, Eau Claire, Wis.

● Flying wing models should be balanced like any other control liner. Balance point should be between leading edge and 25% of chord, with the more rearward position preferred.

The only solution to your problem is to move the engine as far back as possible. You may have to rebuild considerably, notching out the leading edge, so that the engine is actually in the wing.

You might also add a short boom 10"-12" to the trailing edge with lead weight on it to get proper balance.

Afterburner on Jetex "100"? . . . I have been trying to make an afterburner on a "Jetex 100." I have tried to use an empty CO_2 cartridge, drilling a ⅛" hole in the longer end, and a ¼" hole in the other end, inserting the exhaust end of the motor through the ¼" hole, letting the hot gas run through the cartridge, where a nozzle shoots a fine spray of fuel. This fuel should be ignited by the hot gas. This has not been successful. Why?

Stephen Pollard, Tacoma, Wash.

● Any advantage gained by adding an afterburner to a Jetex unit would be more than offset by the additional weight of the added components.

We recommend that you leave this type of experimenting strictly to the rocket engineers. Such attempts may prove dangerous.

You are trying to combine two different types of jet propulsion. The pure rocket (Jetex) has to function entirely by itself. The afterburner is used with turbojet engine: horses, you might say, of two different colors.

Scale effect enters into the problem of designing small jet engines; the simple fact is they cannot be built with a favorable enough power-to-weight ratio. The Dyna-Jet is just about the minimum size such engines can be built and perform well.

Wheels for T-6 . . . For the T-6 in the 1952 Air Trails Model Annual, you listed in the Bill of Materials a pair of "Snafu" wheels. I have not been able to find them locally. Would you please send me the name and address of a firm where I could get either these or similar wheels?

Phil Mitchell, Arkansas City, Kans.

● We find that 2¼" dia. Snafu wheels are no longer being manufactured.

Snafu was located in California. You may be able to find some of their stock still remaining in that area. Suggest you inquire of: Crescent Model Shop, 5342 Crenshaw Blvd., Los Angeles 43, Calif.

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FABULOUS MODELS

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1/2 A ENGINES

1.95

"Infant WAGON"

The ready to assemble ALL BALSA stunt model for all ½A engines. It has been accepted as one of the most efficient, rugged and maneuverable models in its class by those who should know!

.04-.09 ENGINES

1.95

"All American Jr."

The number 1 model in the All American Trainˈng Team. Features simplicity of construction, ease of learning and long lasting ruggedness, all essential for basic training.

.19-.29 ENGINES

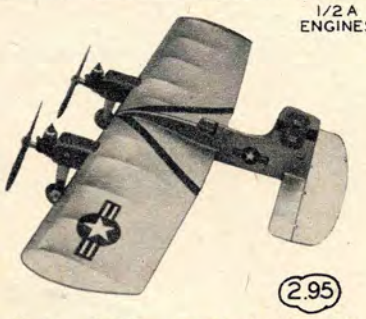
3.95

"Sportwing"

An ideal stunt and combat model featuring lig assembly.

HOLDER OF 4 WORLD RECORDS!

1/2 A ENGINES



2.95

"A/2 TWIN"

The "Twin" is a truly sensational design which brings twin engine flying within everyone's reach. A semi-scale model of the famous Grumman "Skyrocket", it provides the simple means of enjoying the thrill of twin engine flight!

"1/2 A CARRIER EVENT MODEL"

.06-.09 ENGINES

2.50

"All American Jr."

The number 2 model of the All American Training Team is this stunt-trainer designed around the popular .09 engines. Learning stunt flying becomes simple with this correct combination, slow enough to learn with, yet responsive to keep you out of trouble!

.08 - .15 ENGINES

"LIVE WIRE" R/C TRAINER

This is the widely accepted basic-trainer for radio controlled flight. Having been developed for R/C flight primarily it has all of the features which can make your every flight successful, including controlled climb, exceptional stability, excellent maneuverability and extreme ruggedness. The construction is simple and straight forward while the model remains easy to fly!

An exclusive feature is the removable R/C unit that allows easy bench checks of all R/C equipment, use of the same unit in several models and alterations or changes in the equipment with the least trouble. Suitable for ALL makes of radios. Copied perhaps, but certainly never equalled!

6.95

"Stunt WAGON"

FOR .19-.36 ENGINES.....

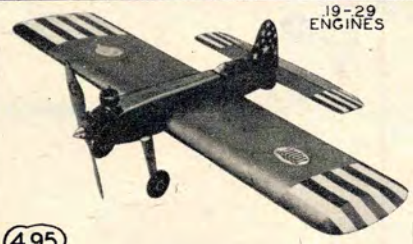
STUNTWAGON "30" ____ 5.95

FOR .49-.65 ENGINES.....

STUNTWAGON "60" ____ 7.95

Supreme Stuntability!

.19-.29 ENGINES



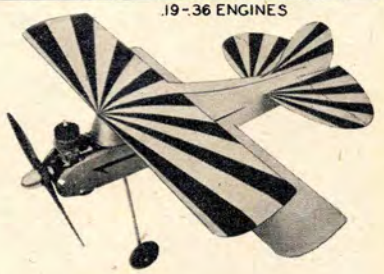
4.95

"All American"

The number 3 model of the All American Team is a full stunt model using dmeco's exclusive "Assymetrical Stability." Developed around the new powerful .19 engines, independent tests have shown it to be a very outstanding precision flight model. Simple straight forward assembly have made it a favorite with those who want superior performance with the least amount of work.

NATIONAL SR. COMBAT CHAMPION!

.19-.36 ENGINES



"New BIPE"

Here is a really different model which has established a basis of comparison for all bi-plane designs. Its many exclusive features give exceptional performance in both stunt and combat flying while it is capable of handling unbelievable amounts of power. Having been built and accepted by over 25,000 flyers it is truly the standard of them all!

3.95

"SPEEDWAGONS"

CLASS A & B.....

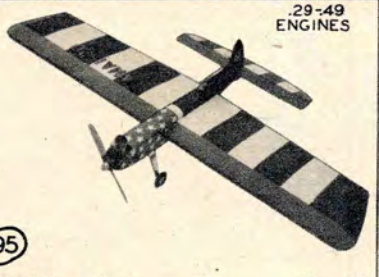
SPEEDWAGON "20" ____ 3.95

CLASS C & D.....

SPEEDWAGON "50" ____ 5.95

This is the contest speed design which has set more records and won more awards than any other single type. Its "Circle Flight" and "Weather Vane Stability" have shown the way to the ultra high speeds being recorded every day! Setting records the world over they are by far the world's fastest models with official speeds of over 162 mph!

.29-.49 ENGINES



5.95

"All American Sr."

The "Star" of the All American Team is this contest winning "Senior," here is the model that even beginners can fly to first place laurels! The design is the culmination of years of effort to provide a fine high performance model that is simple to assemble, easy to maneuver and a cinch to win for you in any competition! Dmeco's exclusive "Assymetrical Stability" provides the means to such fine performance from a model with so little power.

NATIONAL JR. STUNT CHAMPION!

CHOOSE YOUR KIT THE WAY THE EXPERTS DO!

✓Check THESE POINTS!

- ✓ 1. Correct design, tried and proven!
- ✓ 2. GIANT full size plans with details!
- ✓ 3. World's finest hand picked materials!
- ✓ 4. Precision pre-fabrication by experts!
- ✓ 5. Ultra modern dural gears!
- ✓ 6. Complete deluxe hardware!
- ✓ 7. Unconditionally guaranteed quality!

WITH THE EXPERTS "DMECO KITS" ARE TOPS!

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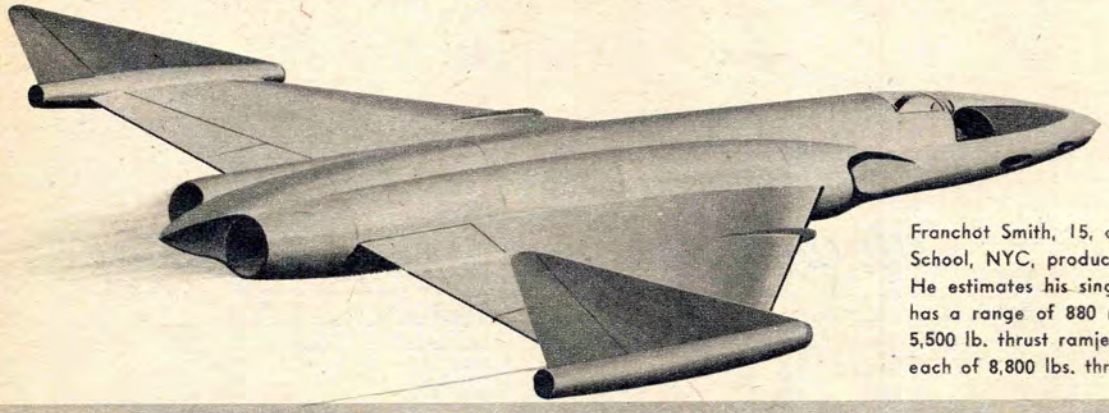
WILLIAMSVILLE, N.Y.

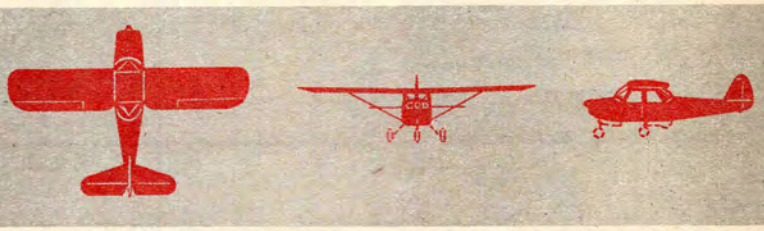
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

1ST AWARD
Four jets power delta wing interceptor

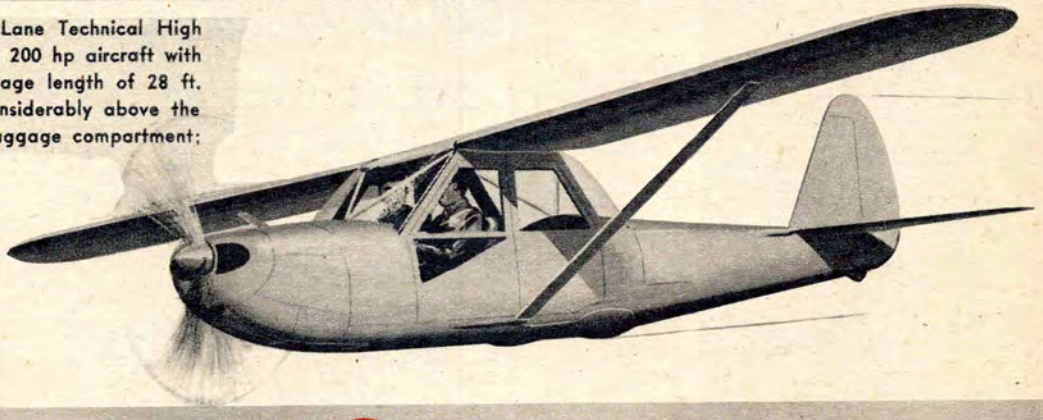


Franchot Smith, 15, of the George Washington High School, NYC, produced the top design for this issue. He estimates his single-seat fighter will do 770 mph, has a range of 880 miles and climbs at 16,000 fpm; 5,500 lb. thrust ramjets on wingtips; 2 axial turbo-jets each of 8,800 lbs. thrust.

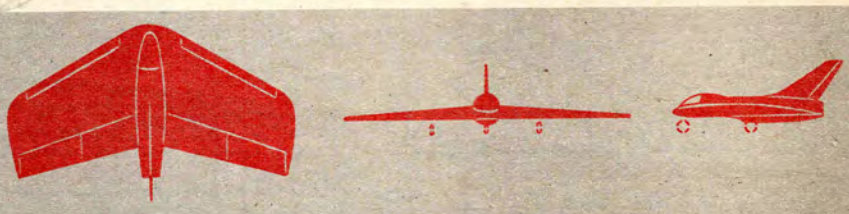
2ND AWARD
High wing 4-pass. personal plane

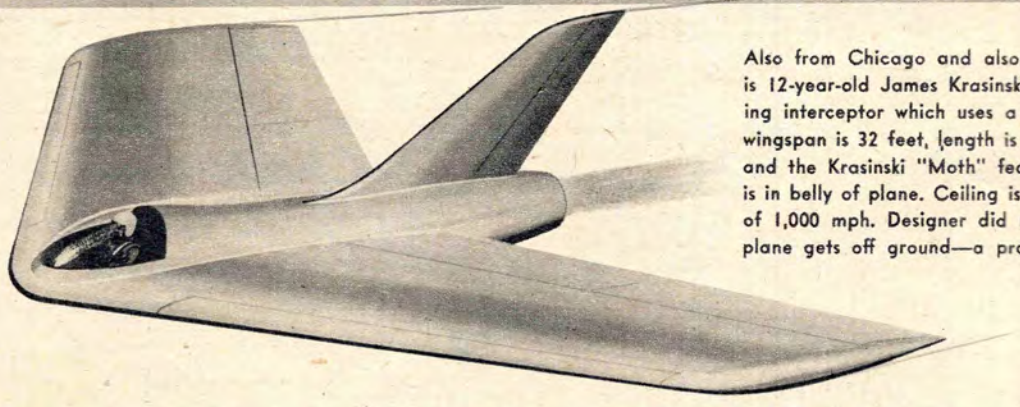


Herman Loellbach, 14, of the Lane Technical High School, Chicago, developed this 200 hp aircraft with wingspan of 37 ft. and a fuselage length of 28 ft. He figures top speed to be considerably above the 150 mph mark. Features large luggage compartment; slots on wing.



3RD AWARD
Moth-wing high-flying fighter





Also from Chicago and also quite young, third place man is 12-year-old James Krasinski. Jim designed this fast-climbing interceptor which uses a ramjet engine for power. The wingspan is 32 feet, length is 23 feet through the "fuselage" and the Krasinski "Moth" features ejection seat. Air intake is in belly of plane. Ceiling is 70,000, speed is in the vicinity of 1,000 mph. Designer did not reveal any details on how plane gets off ground—a problem with an all-ramjet craft.

AIRMEN OF VISION DESIGN COMPETITION

Rules governing the "aircraft of the future" competition are as follows: Three-view sketches of the proposed aircraft will be required. These should be not less than 8½x11 inches for the entire three views. Give sketches of the complete airplane in three-quarter front and rear positions. Photos of a model of proposed design may be included. Information on the power plant(s), estimated performance, dimensions, and explanations of any unusual features are required. Data as to age, occupation or schooling of the entrant will be welcomed by the editors and judges. The design may be of any type: commercial aircraft, military planes (fighters, bombers, troop transports), planes for the private flyer and single-engine sporting or racing craft. The entry each month judged the most practical or of the greatest significance will receive an award of $25. Payment of $5 will go to runners-up. Entries will not be returned and for that reason those participating should keep copies of all material submitted. Mail entries to Airmen of Vision, c/o Air Trails, 304 E. 45th St., New York 17, N. Y. Editors regret that due to large number of entries they cannot enter into any correspondence on Airmen of Vision.

WILL THIS SUIT FIT YOU?

If you can make the grade, you can fly the latest, hottest, fanciest jobs in the air— and do it within one year.

IT TAKES a good, tough, serious guy to wear the equipment of an Aviation Cadet. But if you can measure up, here's your chance to get the finest in aviation training—training that equips you to fly the most modern airplanes in the world and prepares you for responsible executive positions in industry both in military and commercial aviation. And you do your country a service.

It won't be easy! Training discipline for Aviation Cadets is rigid. You'll work hard, study hard, play hard—especially for the first few weeks. But when it's over, you'll be a pro—with a career ahead of you that will take you as far as you want to go. You graduate as a 2nd Lieutenant in the Air Force, with pay of $5,300.00 a year. And this is only the beginning—your opportunities for advancement are unlimited.

ARE YOU ELIGIBLE? To qualify as an Aviation Cadet, you must have completed *at least* two years of college. In addition, you must be between 19 and 26½ years, unmarried, and in good physical condition.

New Aviation Cadet Training Classes Begin Every Few Weeks!

HERE'S WHAT TO DO:

1. Take a transcript of your college credits and a copy of your birth certificate to your nearest Air Force Base or Recruiting Station. Fill out the application they give you.
2. If application is accepted, the Air Force will arrange for you to take a physical examination at government expense.
3. Next, you will be given a written and manual aptitude test.
4. If you pass your physical and other tests, you will be scheduled for an Aviation Cadet training class. The Selective Service Act allows you a four-month deferment while waiting class assignment.

Where to get more details: Visit your nearest Air Force Base or Air Force Recruiting Officer. Or write to: Aviation Cadet, Headquarters, U. S. Air Force, Washington 25, D. C.

U.S. AIR FORCE

Another NORTHROP Graduate Chooses Jet Engine Career

Like many other graduates of Northrop Aeronautical Institute, Keith Englebart chose the fascinating field of jet engines for his career. He's moving ahead rapidly, thanks to his thorough, practical training at NAI. He has already won recognition for his part in setting up a new type of test stand for jet engine fuel systems. At this stage in his promising career, Keith supervises intricate jet fuel-system testing for his company.

NORTHROP Can Help You to Aviation Success!

It's the man with knowledge and training who gets *rapid promotion*—the big share of *important work.* Lack of training, so vital for today's rapidly changing aviation science, can penalize your chance for success! NORTHROP AERONAUTICAL INSTITUTE gives you the background you need—helps you make the most of every opportunity!

Your NORTHROP Diploma—A Passport to Opportunity!

NORTHROP graduates are sought by concerns throughout the aviation industry. The demand is so great, NORTHROP *graduates are offered their choice of interesting, exciting, profitable jobs PRIOR TO GRADUATION!*

Begin Your Aviation Career at NORTHROP!

NORTHROP AERONAUTICAL INSTITUTE is an accredited technical institute open to public enrollment. It is operated independently as a division of Northrop Aircraft, Inc.—a company renowned for advanced aeronautical design and development. NAI's up-to-the-minute courses in AERONAUTICAL ENGINEERING and AIRCRAFT & ENGINE MECHANICS reflect the advantages of this close association. Write *today* for complete enrollment information and a fully illustrated catalog showing NORTHROP training facilities. *There is no obligation!*

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Youth in Aviation

New Model Rules for 1953 Meets

By RAY MATTHEWS, Chairman, AMA Contest Board

■ The ballots are all in and counted for the rules that will govern model flying for the next two years. Some 1500 modelers voiced their opinions and mailed their ballots to the nearest A.M.A. Contest Board member for tabulation. In turn the Contest Board member sent his final tabulation to the Board Chairman where a complete and final tabulation of all districts was made and the 1953-54 rules were born. Most of the rules remain unchanged.

Control Line Speed: You now have a Half-A speed event, flown on .006 inch lines 35 feet long, using an engine of .05 cu. in. displacement or less. Classes C & D were combined. The engine classes for C/L and Free Flight are now the same. This should stop the previous confusion related to sizes of engines for the two types of flying. There will be no change in the method of timing of speed runs.

Control Line Stunt: The stunt boys seem to know exactly what they want. The present A.M.A. pattern will continue with the addition of a few maneuvers. Right now a committee is in the process of writing those maneuvers into the rule book. Nothing else is changed in the acrobatic picture, except maybe for those interested in *Combat.* The combat committee will have the combat rules all rounded up and published soon, but don't look for much change from the Plymouth system.

Free Flight Events: The 10 minute flight limit is now a thing of the past. You set your dethermalizers for 6 minutes now with an unlimited 4th flight in case three 6-minute flights are made. There were no changes at all in F/F gas except the 6 min. limit. Get out your old ships or build new ones like them because you can use them for at least two more years.

Outdoor Rubber: We still have two classes of rubber power models, Wakefield and Limited. The Limited rubber class is a model of 200 sq. in. area, wing and stabilizer combined, and weighs not less than 5 ounces. That's all—no cross section, no landing gear. Just 200 sq. in a 5 ouncer, but don't forget that the stab is counted in that 200. Remember the old Class C stick models we flew a few years ago? Why not go up in the attic and drag down one of those old jobs just for laughs because they will sure fill the bill. Attention, manufacturers! Here is a chance to produce something worthwhile, something that will encourage the beginners; produce us a kit that the youngster can put together and compete with the old timers. Give us a kit for the Limited Rubber class now—not next summer.

Towline Gliders: A model must have a maximum combined wing and stabilizer area of 350 sq. in. and weigh at least 10 oz. to fit the new Limited Towline Glider rules (no cross section requirement). Also we now have a Nordic A/2 glider event (which will be the counterpart of the Wakefield Rubber power event). The Nordic glider is an International event and the rules are established by an International organization. Basically the Nordic glider is a larger glider than the Limited glider with a few more requirements. See Frank Zaic's latest book on model design for the Nordic details (*also Dick Everett's column in this issue—Ed*). All Towline Gliders will be flown with a 328 towline (*Continued on page* 72)

Ray (wife Frances assisting) fires up U.S.-Mexico PAA-Loader to carry watch across Rio Grande.

If it's CLEVELAND it's Good!

For Over 1/3 Century Now!

Build these SIMPLEX Jet Jobs!

(Left)
14¼" MC DONNELL F-88 VOODOO S-127

18" NORTHROP F-89 SCORPION S-128
(Top Left)

(Above)
14¼" REPUBLIC F-84 F THUNDERJET S-126

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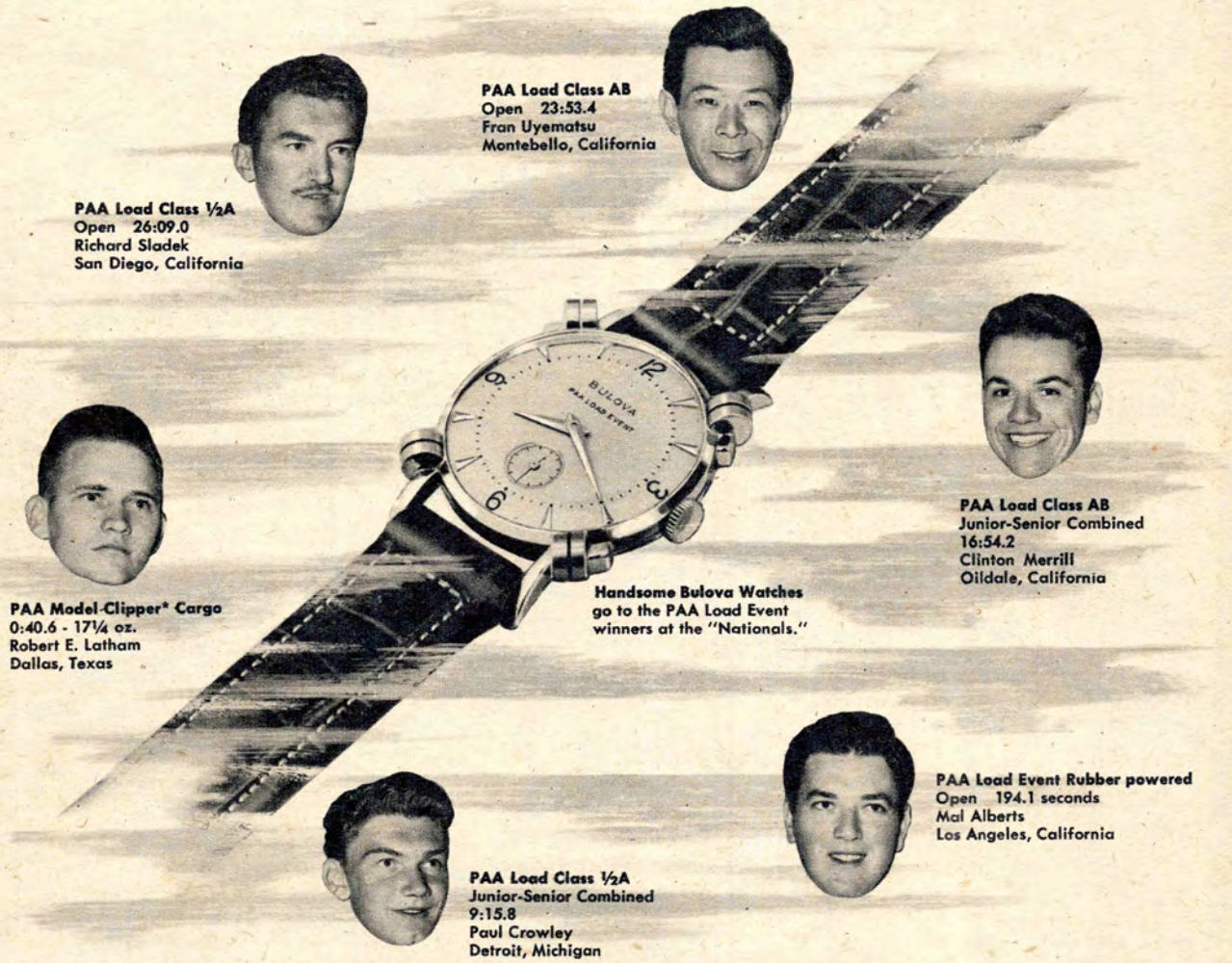


PAA LOAD EVENTS

at the 1952 "NATIONALS" Los Alamitos, California

● Records are made to be broken, and these 1952 Champions *all* had the stuff to do it. By the close of the PAA Load Events at the "Nationals" a brilliant new set of records stood ready to meet the onslaught of 1953's hopefuls.

These exciting contests provide model flying that brings out the basic purpose of aviation itself—*to carry a payload.*

First sponsored by Pan American in 1948, payload events are free flight headliners at many local and regional meets—and a highlight of the "Nationals." Start your payloader today.

For rules and specifications for 1953 PAA Load Events, write to: Educational Director, 28-19 Bridge Plaza North, Long Island City 1, New York.

*Trade-Mark, Reg. U. S. Pat. Off.

PAN AMERICAN

WORLD'S MOST EXPERIENCED AIRLINE

Air Sailors at Sea

In peace, war, or police action it's the aim of the Navy always to be prepared . . . this photographic essay catches the highlights of war games at sea

Photos by ALMASY

■ The reluctant sun has barely risen from its bed below the distant horizon when the first of the thunderous jets arrives at the catapult for take-off. Not a single silent moment marks the daylight hours, nor does the night offer the quietude that settled down on ships of old. For these half-sea, half-air men are slaves to an all-metal, mechanical flat-topped craft which by windjammer standards is ungainly in line, carries no cargo fit for barter, and contains such improbable items as a machine shop, a soda fountain and three separate bridges—one for the skipper, one for the flight commander and one for the admiral. Yet the sailor of old transplanted to a modern U. S. Navy carrier like the "Midway" could not help but marvel at the efficient manner in which 3,500 individuals serve the ship and service her aircraft without confusion, without delay, in all kinds of weather and in all waters of the world. Nowhere does man demonstrate his triphibious conquests better than at sea aboard a carrier. The adventurous sailor who conquered the sea now masters the air with equal ease.

AIR SAILORS AT SEA

The American Navy is global in every sense of the word. It is doubtful that there is a free port in the world where the familiar U. S. union jack is not flying from the bows of a naval vessel. Pictured here are activities on board the 50,000-ton aircraft carrier Midway during a European tour of duty as part of the Mediterranean 6th Fleet. Fine chance to see fabled sights—but all was not play and liberty for the bluejackets and officers of the Midway. NATO exercises took on the grim aspects of warfare. . . . As battle alarm sounds, jet, piston fighters and attack planes roar off the carrier's deck in the early morning to fly training missions. Air forces of other countries join in the exercises which take days and cover the entire Mediterranean coastline.

F4U Corsairs are refueled on carrier deck after landing.

With USS F.D.R. in background, Corsair waits turn to land.

In cavernous hangar deck the planes are stored and maintained.

Early morning sun casts long shadows of men and planes on deck.

Meteorological crew launches "RaWind" balloon to check winds.

AD's, striking eagles of the Navy with hitting power of cruiser.

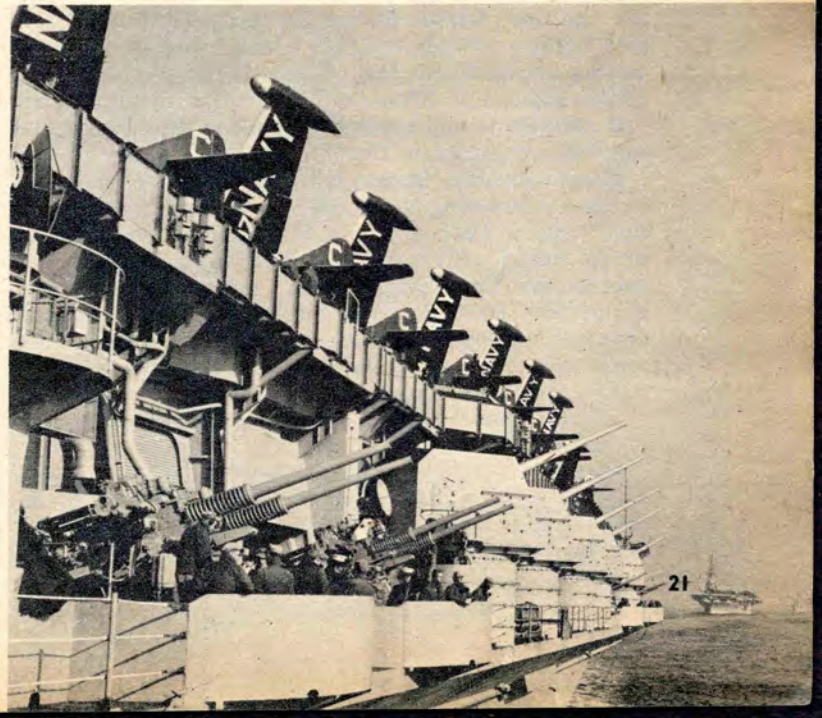
Like a giant grasshopper, a Banshee is tethered at the catapult.

A Corsair folds its wings while taxiing to hangar elevator.

Silhouetted against a setting sun, a Panther prepares to land.

Guardian angel 'copter ever ready to rescue downed pilots.

Guns and wings point skyward from the carrier Midway.



FLAME-OUT at 33,000!

By BRUCE N. TUTTLE

Test Pilot for Grumman Aircraft Engineering Corp.

The engine dead, take your choice—shoot yourself out of the jet and parachute to earth, or ride the Panther down to a water landing

■ How does it feel to crash a jet? Come with me on my next test flight and you'll know.

It is a blustery, cloudy day. A cold December afternoon on Long Island. Several jet Panthers at the Grumman plant await testing. The plane I pick needs some testing above 30,000 feet. I put on my "G" suit and winter flying suit, these are followed by my rubber life vest, parachute and helmet. The plane captain is waiting and we go out to the line.

Pilots habitually inspect the plane from the outside to be sure everything is in order. Controls, airspeed system, landing gear and flaps O.K., and all hatches and doors closed. All set. Fire truck and starting jeep standing by. Three steps up and I swing into the cockpit of the sleek, 600-plus mph Panther. A quick check of all switches and lights shows everything is in order. A few minutes later I am strapped securely to the seat, "G" suit plugged in, oxygen and radio equipment working. The plane captain climbs down and moves to the edge of the wing.

Battery on, fuel on, engine switches on, fuel system selector set, throttle closed. I look out and nod to the plane captain. He signals the driver of the starting jeep. The jeep engine roars to life and the powerful starting generator is ready. I flip the starting switch, hear the jeep engine labor as the generator starts winding up the big jet engine behind me. I watch the tachometer slowly climb to starting rpm. Now—energize the igniters—pause—feed it fuel. The throttle is at idle and I watch the tachometer and tailpipe temperature gauge. *Boom*—the sound like distant thunder and the rising tailpipe temperature tell me that my engine has lit off. Rapidly, the engine accelerates to idle speed. The starter jeep and fire truck pull away, their job completed.

Quickly, so as not to waste fuel, I check the engine operation and all the airplane systems. Engine O.K.—flaps, speed brakes, booster system O.K.—electrical system O.K. I carefully go through the take-off check list printed in the cockpit . . . flaps down, speed brakes up, boost on, trim tabs set . . . right on down the line to eliminate any possibility of an unsafe take-off.

I nod to the plane captain. He runs in and pulls the chocks from under the wheels. Time to close the canopy. The canopy closes and shuts out most of the roar of my engine and I hear instead the high-pitched whistle of the pressurization system pumping warm air into the cockpit. Time to go.

"Grumman tower from Grumman flight 16, request

taxi clearance."

Back from the tower Lou Salvante, chief operator, gives me clearance: "Grumman flight 16, cleared to taxi, runway 33."

About a minute later I'm turning the Panther into the 15-20 knot wind, ready for take-off on runway 33.

"Grumman tower from Grumman flight 16, request take-off clearance."

"Flight 16 from Grumman tower, you are cleared for take-off."

Hold the brakes and move the throttle full open. The plane strains against the brakes while I make a quick check of the instruments. Everything's fine. I release the brakes and we're started. Seconds later the runway sizzles under the wheels and we're doing better than 100 mph. Back on the stick and off she comes. Wheels up, pick up speed, then retract the flaps. I turn north and start climbing. There are some big holes in the clouds over Long Island Sound and I head for them. I climb up to altitude, remaining over the area of broken clouds so as to keep a constant check on my location.

Thirty thousand feet. Time to start testing. As I complete my call to the tower, informing them that I'm starting the test, I hear S. A. "Connie" Converse call the tower for taxi clearance. Connie is Grumman's chief test pilot and is flying standby for test flights today. He is in a Grumman amphibian, the G-21, nicknamed the "Goose."

I finish my test at 30,000 feet and climb to 33,000 feet. By this time, Connie is in the air over the north shore of Long Island. He calls me for a radio check.

"Flight 16 from flight 4, radio check."

I respond with, "Flight 4 from flight 16, I hear you loud and clear. I am 33,000 feet over Norwalk heading east—starting my second test."

Two minutes later I'm over the Sound between Bridgeport, Connecticut, and Port Jefferson, Long Island, intent on my test. I start one of the more severe engine tests on my test sheet. I never finish it. The engine rumbles, stumbles, and dies. The engine rpm unwinds wildly and the tailpipe temperature drops rapidly toward zero. No time to waste now.

"Grumman tower from flight 16. I have a flame-out at 33,000 feet just south of Bridgeport."

Mary Quist, Assistant Chief Tower Operator, responds, "Roger, flight 16, we will stand by."

After closing the throttle to prevent flooding the engine and turning off non-essential equipment, I glide the plane down in a gentle spiral. The air forces the engine to windmill slowly at the rpm I will need for an air start attempt. I had experienced a flame-out under similar conditions about three weeks previously and the air start attempt then was simple and successful. Nothing to do now but wait until I get down to more dense air so I can re-start the engine.

With the engine out and all operating equipment (except the oxygen system) shut off, a seeming dead silence is experienced. The experience is not unpleasant at this altitude and plenty of time is afforded to review the air starting procedure.

O.K., we're well below 33,000 feet now—time to try an air start. Windmilling rpm O.K., switches on, energize the igniters and then open the throttle to idle. Five seconds, ten seconds—she should lite up any second now . . . fifteen seconds, twenty, thirty seconds! Something's wrong. No start yet. Best shut everything off and clear out the engine for a few minutes. She's sure to start next time. The second attempt ends like the first and so does the third. Now I know I'm in real trouble. Better call the tower.

"Grumman tower from flight 16, I can't get a start. Am heading toward the Eaton's Neck Coast Guard Station."

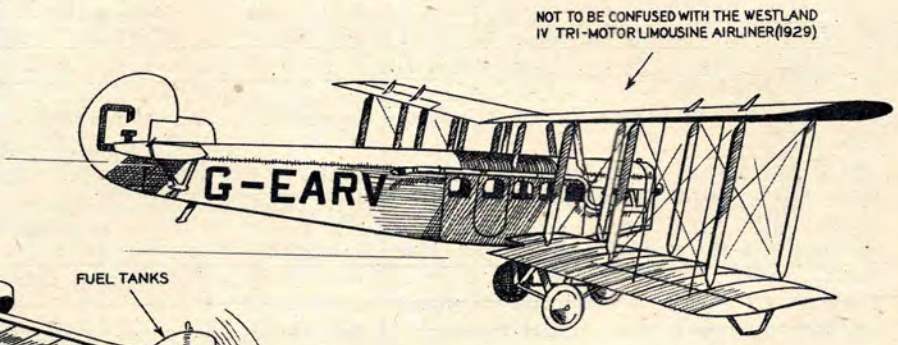
Connie Converse, flying over the Coast Guard Station, makes ready for a rescue operation. With him is Rollie Corwin, the plane captain of the amphibian. Back at Grumman, other amphibians are warned and take off. The Coast Guard is notified and the rescue machinery gets into high gear.

Back in the Panther, I have two choices, if I fail to get my engine started. I can shoot myself out of the jet with my ejection seat and parachute to earth or I can ride it down and make a water (*Continued on page* **69**)

AIR PROGRESS

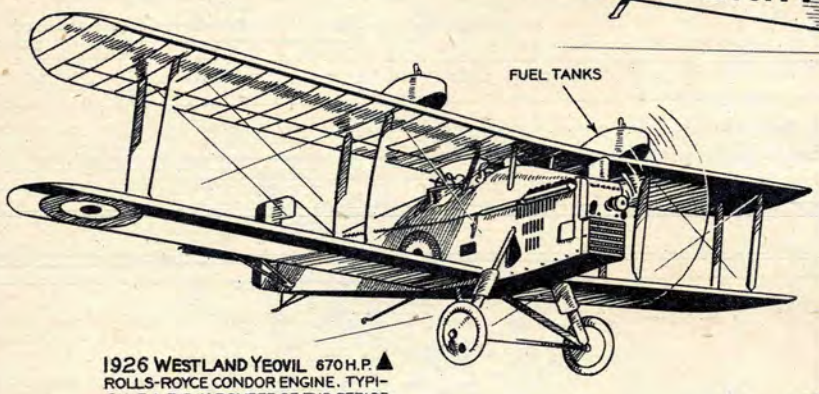
By DOUGLAS ROLFE

THE WESTLAND STORY

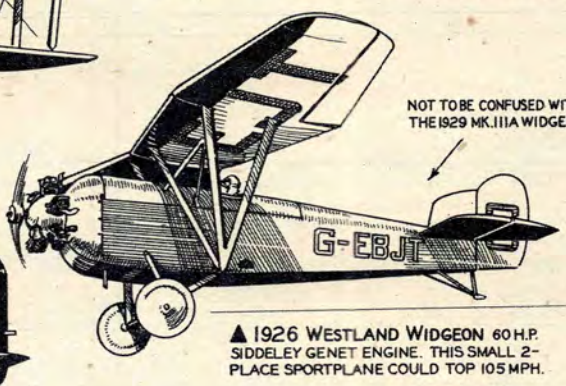


NOT TO BE CONFUSED WITH THE WESTLAND IV TRI-MOTOR LIMOUSINE AIRLINER (1929)

▲ 1924 WESTLAND LIMOUSINE ONE OF THE FIRST SPECIALLY DESIGNED COMMERCIAL AIRLINERS BUILT TO REPLACE THE CONVERTED WORLD WAR I BOMBERS GENERALLY EMPLOYED DURING THE FIRST POST-WAR YEARS

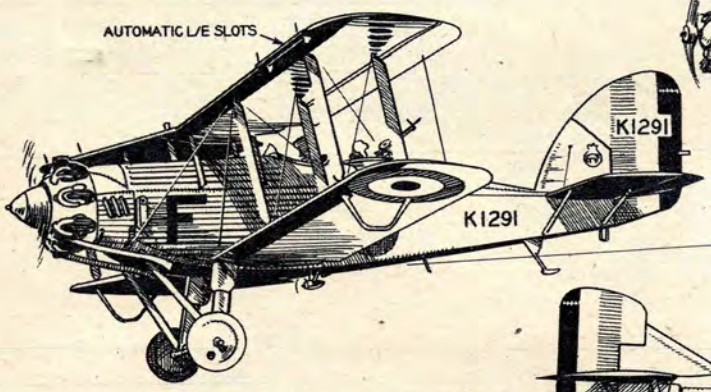


1926 WESTLAND YEOVIL 670 H.P. ▲ ROLLS-ROYCE CONDOR ENGINE. TYPICAL R.A.F. DAY-BOMBER OF THE PERIOD

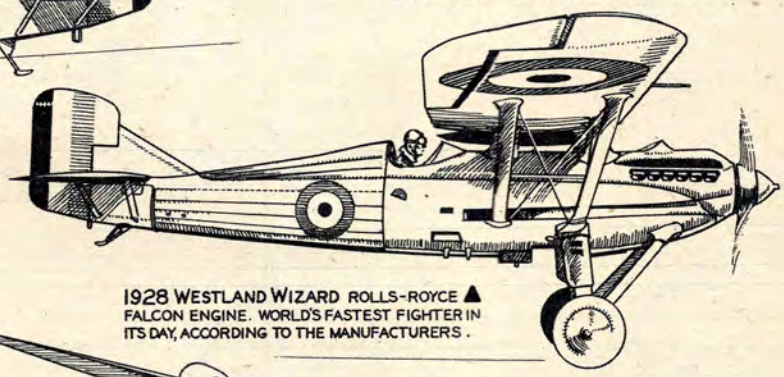


NOT TO BE CONFUSED WITH THE 1929 MK.IIIA WIDGEON

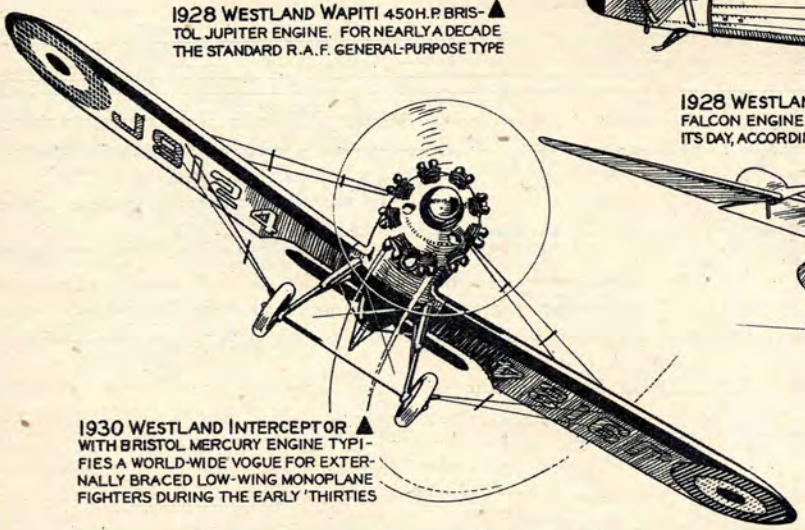
▲ 1926 WESTLAND WIDGEON 60 H.P. SIDDELEY GENET ENGINE. THIS SMALL 2-PLACE SPORTPLANE COULD TOP 105 MPH.



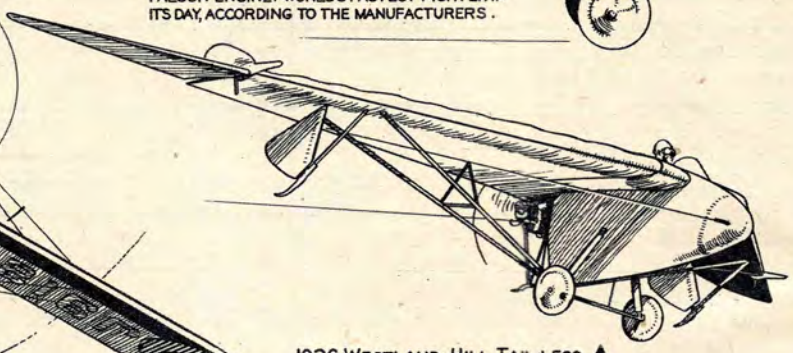
1928 WESTLAND WAPITI 450 H.P. BRISTOL JUPITER ENGINE. FOR NEARLY A DECADE THE STANDARD R.A.F. GENERAL-PURPOSE TYPE ▲



1928 WESTLAND WIZARD ROLLS-ROYCE FALCON ENGINE. WORLD'S FASTEST FIGHTER IN ITS DAY, ACCORDING TO THE MANUFACTURERS. ▲



1930 WESTLAND INTERCEPTOR ▲ WITH BRISTOL MERCURY ENGINE TYPIFIES A WORLD-WIDE VOGUE FOR EXTERNALLY BRACED LOW-WING MONOPLANE FIGHTERS DURING THE EARLY 'THIRTIES

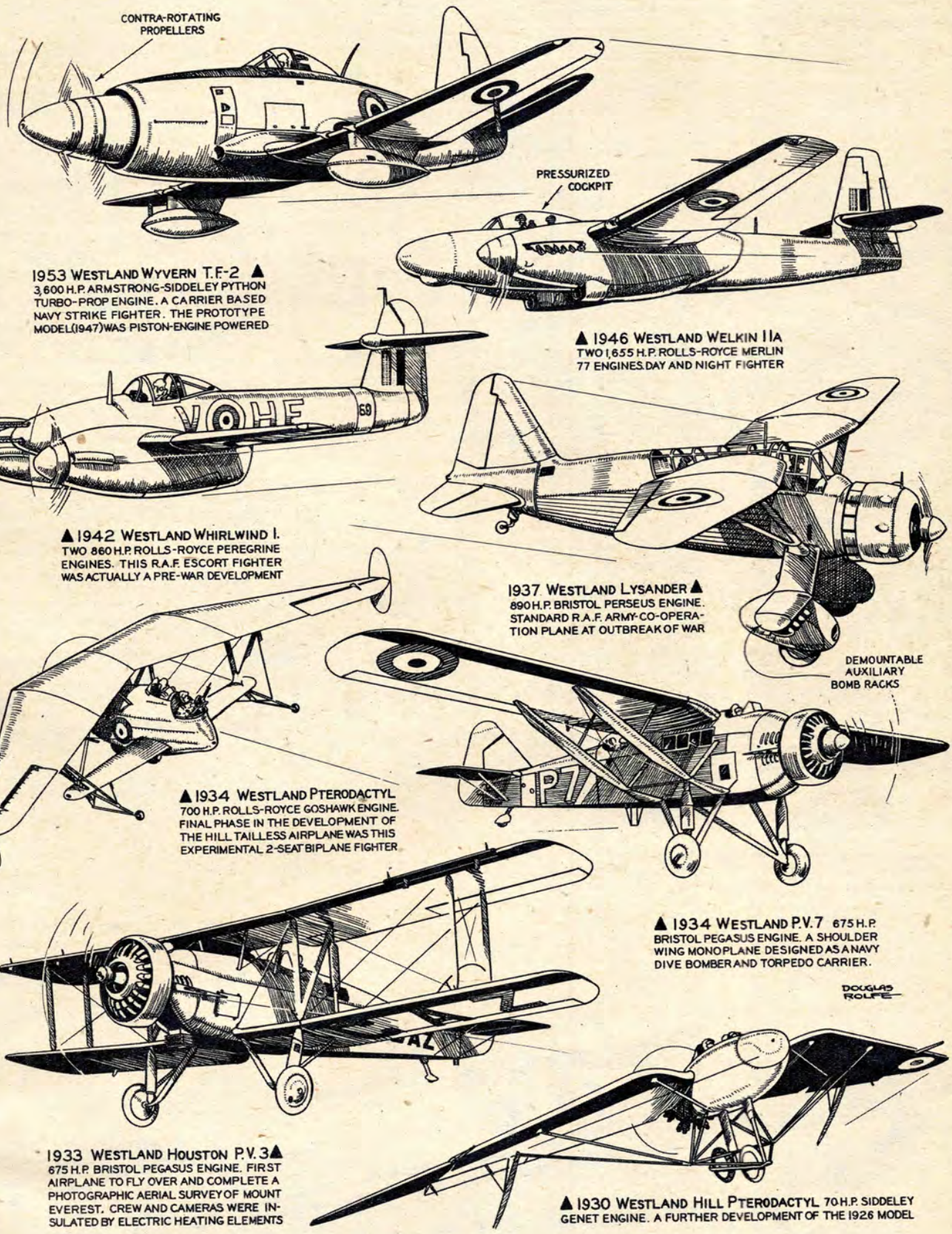


1926 WESTLAND-HILL TAIL-LESS ▲ 32 H.P. BRISTOL CHERUB ENGINE. EXPERIMENTAL PROTOTYPE MODEL PTERODACTYL

Not too well-known in America but still one of the older aircraft manufacturers in business today, Westland Aircraft dates from World War 1 when this company, a subsidiary of the engineering firm of Petters Ltd., started making airframes and completed airplanes under contract from established manufacturers' designs.

The first genuine Westland aircraft did not appear until after the Armistice in 1919 and at that period were mostly commercial types. Later, like so many other aircraft companies all over the world, Westland was obliged to rely on government support for its daily bread, hence concentrated on military and naval designs.

Westland was among the first to produce a high-performance, long-range escort fighter, and the Westland Whirlwind,

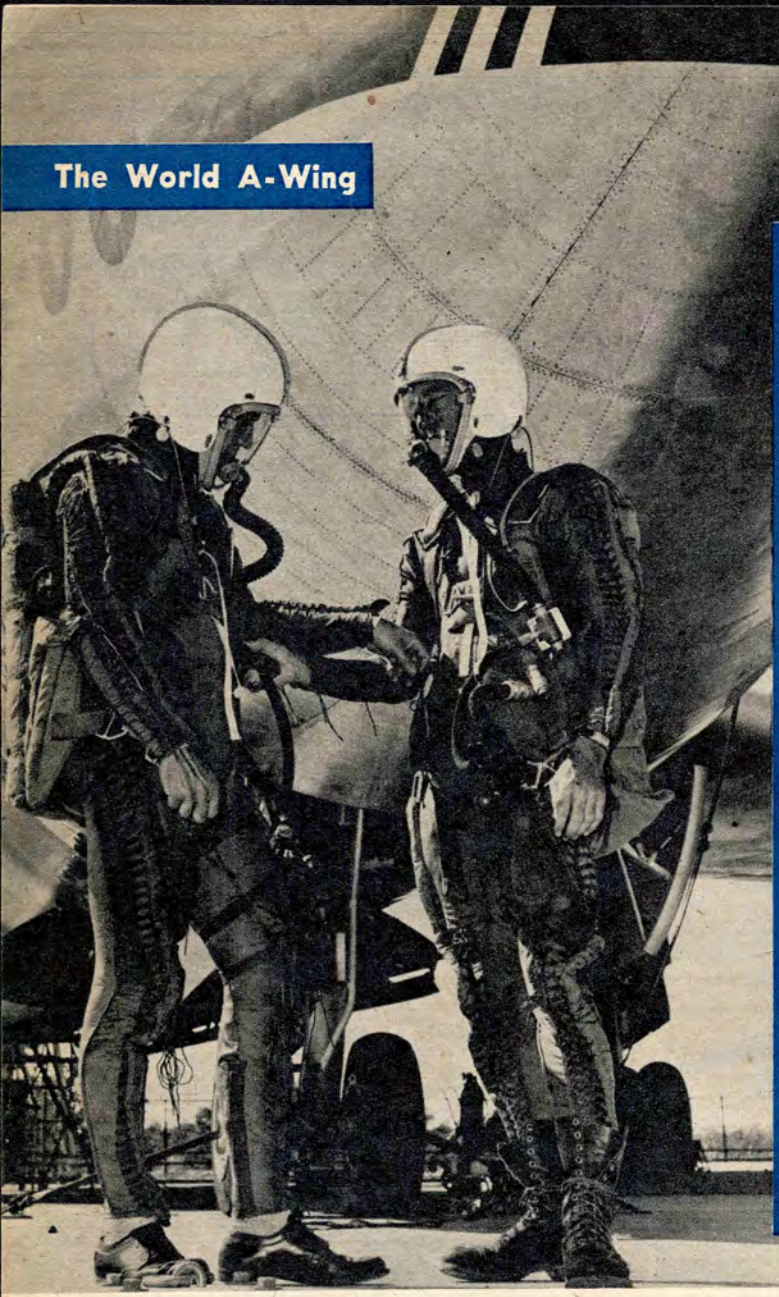

CONTRA-ROTATING PROPELLERS
PRESSURIZED COCKPIT
1953 WESTLAND WYVERN T.F-2 ▲
3,600 H.P. ARMSTRONG-SIDDELEY PYTHON TURBO-PROP ENGINE. A CARRIER BASED NAVY STRIKE FIGHTER. THE PROTOTYPE MODEL(1947)WAS PISTON-ENGINE POWERED
▲ 1946 WESTLAND WELKIN IIA
TWO 1,655 H.P. ROLLS-ROYCE MERLIN 77 ENGINES. DAY AND NIGHT FIGHTER
▲1942 WESTLAND WHIRLWIND I.
TWO 860 H.P. ROLLS-ROYCE PEREGRINE ENGINES. THIS R.A.F. ESCORT FIGHTER WAS ACTUALLY A PRE-WAR DEVELOPMENT
1937 WESTLAND LYSANDER ▲
890 H.P. BRISTOL PERSEUS ENGINE. STANDARD R.A.F. ARMY-CO-OPERATION PLANE AT OUTBREAK OF WAR
DEMOUNTABLE AUXILIARY BOMB RACKS
▲1934 WESTLAND PTERODACTYL
700 H.P. ROLLS-ROYCE GOSHAWK ENGINE. FINAL PHASE IN THE DEVELOPMENT OF THE HILL TAILLESS AIRPLANE WAS THIS EXPERIMENTAL 2-SEAT BIPLANE FIGHTER
▲ 1934 WESTLAND P.V.7 675 H.P.
BRISTOL PEGASUS ENGINE. A SHOULDER WING MONOPLANE DESIGNED AS A NAVY DIVE BOMBER AND TORPEDO CARRIER.
DOUGLAS ROLFE
1933 WESTLAND HOUSTON P.V.3▲
675 H.P. BRISTOL PEGASUS ENGINE. FIRST AIRPLANE TO FLY OVER AND COMPLETE A PHOTOGRAPHIC AERIAL SURVEY OF MOUNT EVEREST. CREW AND CAMERAS WERE INSULATED BY ELECTRIC HEATING ELEMENTS
▲1930 WESTLAND HILL PTERODACTYL 70 H.P. SIDDELEY GENET ENGINE. A FURTHER DEVELOPMENT OF THE 1926 MODEL

designed prior to World War II, was probably the first such Allied fighter available during hostilities to afford protection to the mass bomber penetration of the Third Reich. The present-day Wyvern, one of the few turboprop fighters in service, compares favorably with all but the most modern jet-powered types in this field and is one of the most powerful strike fighters in service today anywhere in the world.

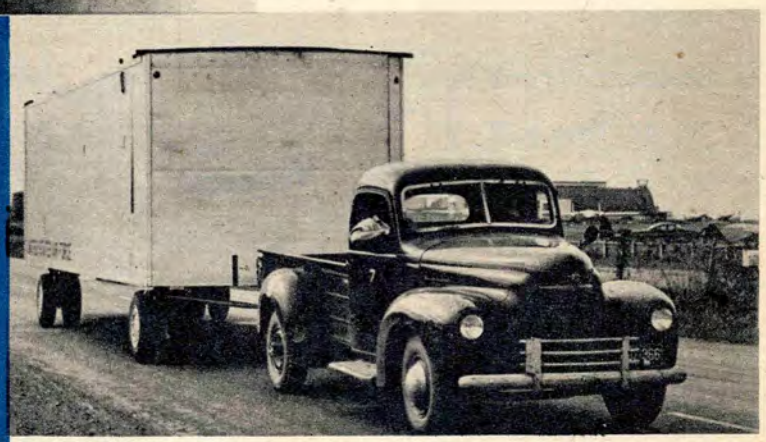
Westland also made a notable contribution to aviation in its long research into the possibilities of the all-wing airplane. These experiments, which terminated in the curious 1934 Pterodactyl fighter shown on these pages, resulted in most of the practical data available today on this form of aircraft.

Definitely, Westland has contributed to air progress.

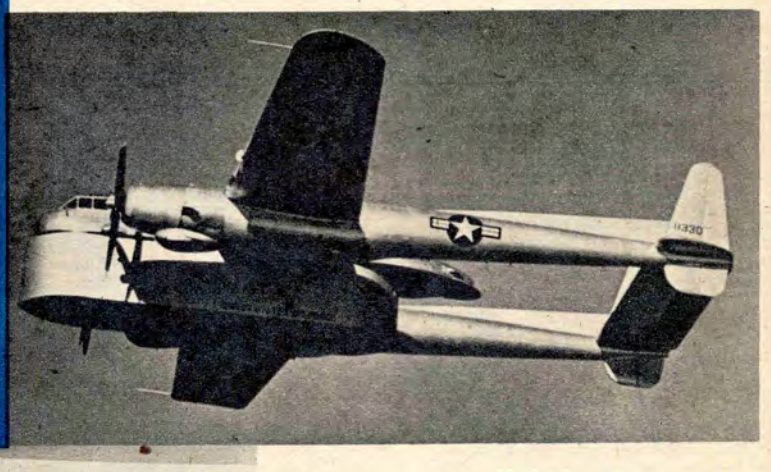
The World A-Wing



High-altitude, pressurized suit specially designed to save crew lives in event pressure in cabin fails at altitude above 45,000 ft. Helmet divides in two halves, has transparent faceplate, oxygen supply.



Flying Trailer. Detachable cargo compartment designed to be attached to the Fairchild XC-120 Pack Plane. It is equally at home on highway and in the air. Has same cargo capacity as C-119. Hitchable to any military or civilian heavy vehicle.

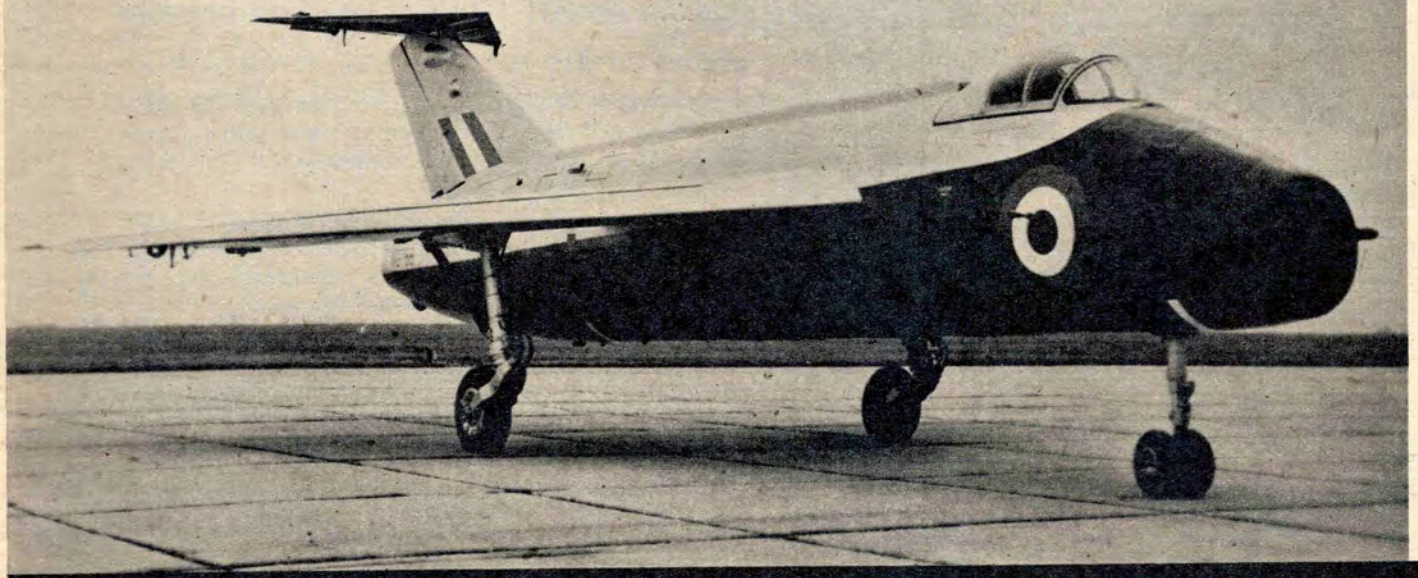


Golden Year Cessna 170. Latest model of the popular four-place personal plane named in commemoration of the Golden Anniversary of Aviation. Plane has a longer, sleeker nose and Para-Lift flaps as on the L-19 Bird Dog. Other changes are revised instrument panel, better heating and ventilation. Cruises at 120 mph.

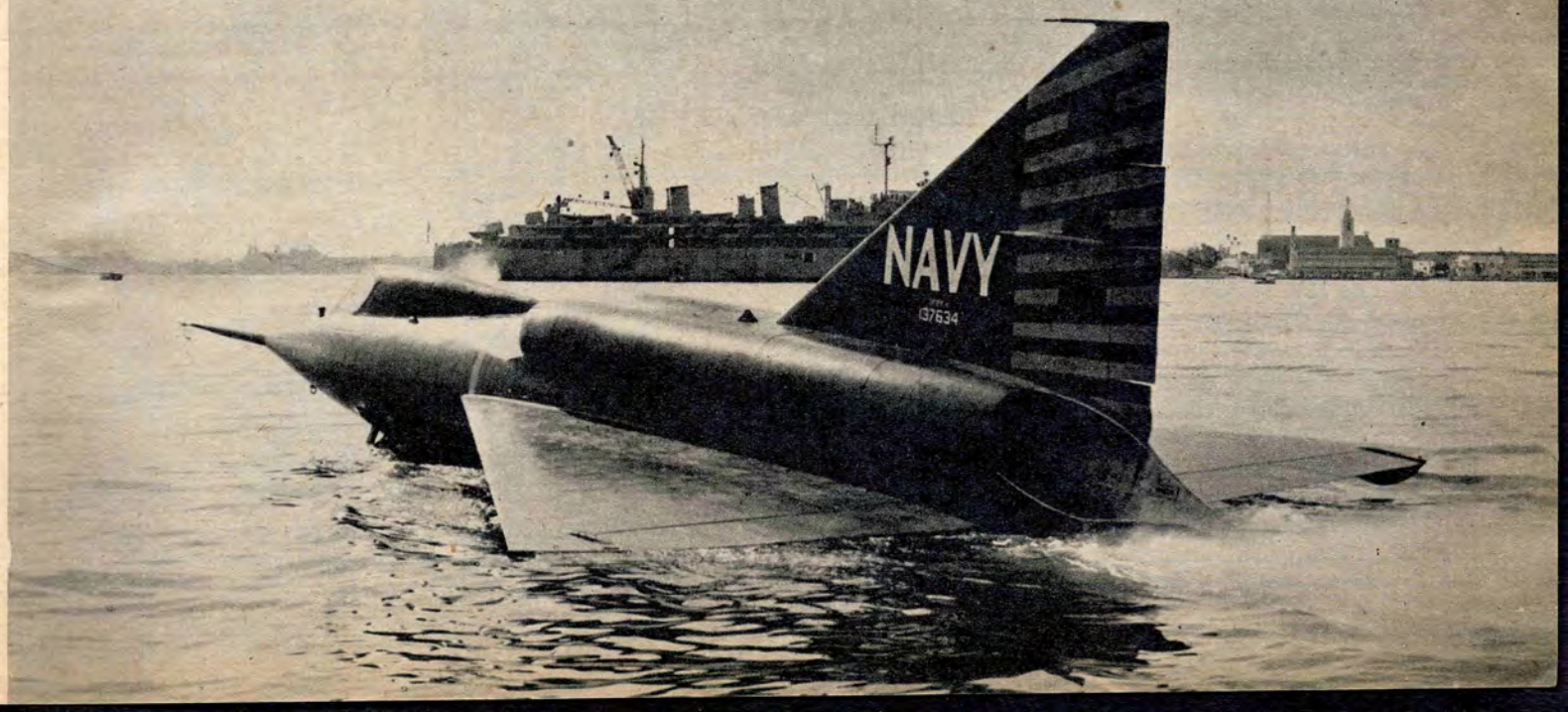
U.S. TESTS WORLD'S FIRST DELTA WING SEAPLANE

Navy's latest anti-submarine plane, the Grumman S2F-1, carries latest sub-detecting and destroying devices. Crew of four. 1400 hp engines.

Short S.B./5, England's newest swept-wing jet research plane. Angle of sweep is adjustable on ground. 3600 lb. thrust R.R. Derwent.



Convair XF2Y-1 Sea Dart. World's first delta wing seaplane jet fighter undergoing test in San Diego Bay. Hydro-skis, 2 West. jets.



When they really *built* modelplanes!

By DONALD IRVING

Meet Uncle Mike and his model aeronaut friends, a mighty band of bamboo benders

■ That is what started me to thinking about my late Uncle Mike. Those two guys in the depot, I mean. You see, I was waiting there for the 5:15, and they were sitting nearby and I couldn't help but overhear their conversation. They weren't talking about model aviation, at first. They were mumbling some strange jargon concerning prefabs, thermals, yo-yos, R/C, sweat solder and other crazy stuff like that, so I didn't listen very hard.

Then they began to discuss model airplanes and my ears pricked up right away, because I'm an old model man myself. Back in the late Twenties I could bend a mean hunk of rattan, and with a razor I could slice a piece of bass down to the width of a toothpick. Of course, I haven't built any models in years, but I guess I could still show the present-day modeler a thing or three.

"Let me show ya what I got here," says one of the fellows to the other, slapping a parcel he is holding on his lap. "I'm going to build a plane from this kit that will hang on the clouds!"

And he peels off the paper and opens the box. I nearly dislocate my neck to get a good gander at the contents. The next second my eyeballs are standing out so far you could've knocked them off with a cue stick!

Build a plane, he had said. Why, the plane in that box was practically already built! All he had to do was to slap on the wings and a few more parts, and the "building" job was done! Shades of my Uncle Mike!

He built models back around 1910-1912. And he *built* them! Don't snicker. Maybe they didn't have any books and Air Trails devoted to model flight theories, design and construction in those days, but they did all right. They pioneered the craft, and their crude productions were often the result of tortuous trial and error methods —and no little ingenuity. Through their efforts, the basic principles of construction and flight were evolved.

In the earliest days, the pioneers had little outside aid, but by 1911 there were a few companies manufacturing kits and supplies. Among these were the White Company, the Wading River Company and the Ideal Aeroplane and Supply Company. These organizations turned out some fair numbers considering the materials and knowledge then available.

The kits of that era had one thing in common: they didn't pamper the builder. The plans were not overburdened with information, and the directions were inclined to be scanty. There were a few machined parts such as propellers, wheels and motor mounts, but on the whole one had to do considerable work and some original thinking when assembling and flying them. The finished product was decidedly on the heavy side, by today's standards, and flights were of short duration.

If a guy couldn't afford to purchase a kit (prices, from

The author posing with his Spad constructed from a kit manufactured by the U.S. Model Aircraft Corp. which featured die-cut ribs.

$3 to $12)—and many modelers couldn't—he could buy the plans and scrounge around for materials. Some of the old-timers spurned kits, considered "kit-men" effeminate, and preferred to design their own masterpieces. Experiment was the order of the day, and the system produced some weird efforts, but it did weed out the men from the boys and resulted in gains in the field of original design.

Although the standard model-making tool was the jackknife, a brad-awl and a selection of fine hand-drills made the work easier. Such supplies as rubber, silk fabric, bamboo paper, fiberloid (a celluloid-like material for wing covering), rattan (reed, for wing edges and landing gear), propeller blanks, metal, fiber and finished wood propellers, bamboo, bass and spruce, and a variety of metal parts could be purchased from supply houses.

The pioneers had their clubs, too. The first in America was founded in 1907, in New York City. By a woman, yet! A Miss E. L. Todd. In a few years the club idea had spread across the country. Clubs also flourished in England, Japan, France and Germany. The Junior Aero Club of America, the first master organization, was also founded during this period.

Meets were fairly common, though rules were not yet standardized. A replica model was usually referred to as a miniature aeroplane; a flying scale was a "flyer;" and a racing type was simply called a "racer." Flying was done on dead calm days in areas free of buildings and trees. Racers, some of fantastic design, dominated the meets which also had special events for the "hydro-aeroplane" (practically a lost art today).

There were events for "Hand-launched," "Off Ground," "Hydro Off Water," "Single Tractor," and so on. Distance *and* duration counted in every flight. For example, in a single flight one might win a third for distance and a first for duration, and receive corresponding points for each.

Some of the individual regulations included: a contest to be official must have at least five contestants; contests should cover a period of three hours, unless otherwise agreed; models to be set on the ground (Off Ground) and allowed to start off without any push from the contestant; models must rise from the ground to clear a rope or stick placed on the ground, and no flight is to be considered official unless it does so; contestant has the privilege of changing the planes and propellers as he may see fit, but only three frames can be used in any contest.

Motive power, of course, was furnished by rubber strands, a medium first introduced in model flight by the brilliant Frenchman, Penaud, in the 1870's. To digress for a moment, although steam engines, spring motors, compressed air motors and "petrol" engines attempted to make inroads as a source of power, rubber was king until well into the Thirties, when efficient, low-priced gas engines won acceptance by the world's model builders. And the old rubber motor ain't dead yet!

The pioneer modelers quickly recognized the prime qualities of para rubber; when it was not in use, they carefully powdered it with chalk, stashed it away in a can or a jar in a dark, cool spot to preserve its life. To lubricate it, they used a solution of soap and water.

In 1911, a young American, Cecil Peoli, designed his famous "Peoli Racer." On August 19 and September 16 of that year, his racer set an official record of 1,691 ft., 6 in., and an official duration record of 48 4/5 seconds in meets held in New York City's Van Courtlandt Park. Unofficially, it turned in one flight of 2,500 ft.

The Ideal Aeroplane and Supply Company snapped up Peoli's design and marketed it in kit form. It was about this time that my Uncle Mike was riding the crest of a series of failures in homemade design, so he decided to regain his confidence by constructing a Peoli Racer. He purchased a set of plans and grimly set to work.

About 900 per cent of the ingredients that went into a Peoli consisted of bamboo. In fact bamboo was a catch-

Ideal models from "the good old days." Catalog sheets (from left) describe three-foot Bleriot Monoplane kit ($5 with silk covering included); the EveryBoy's 3½ ft. monoplane had bulkheads with special locking and spacing device; the NC-4 kit made up into a 4½ ft. model; and the ideal Fokker (2 props free wheeled) which sold for $8.50.

word of the times. A model was built of bamboo, wings were covered with bamboo paper, and the whole was coated with bamboo varnish.

Fortunately for many a penniless modeler of that era, the citizens employed large bamboo porch screens (they were a cross between a shade and a venetian blind) to shut out the glare of the summer sun. Well, sir, Uncle Mike eyed his Peoli plans and then his old man's bamboo porch screens. The next day, one of the latter had shrunk one foot, and he was busily engaged in constructing the Peoli.

Don't laugh at bamboo. Though it isn't easy to work with, it is hard, light and tough as a nut. The Peoli Racer has spars, ribs, landing gear and cross braces of this material. Uncle Mike spent patient hours steaming his bamboo lengths over a singing kettle before bending them into the desired forms and placing them in jigs made of nails (soaking the lengths in water was another process employed).

This was also the period of the "lashing." Though brads were used for the most part in joining the members of scale models, the various members of a racer were lashed together with strong black thread and glued (veterans recommended fish glue). Ribs were lashed and glued to the spars, motor blocks were lashed and glued to the frame, and so on.

After long travail, Uncle Mike completed his Peoli and carted it over to Van Courtlandt Park for its maiden flight. While a pal clutched it firmly, he wound up the twin motors with his revised Dove egg-beater (winding drill), hooked up the props, and then grandly held it over his head in good launching style. With just the proper push, he cast it forth.

Well, son, that Peoli immediately pointed its nose skyward, shot upwards like an arrow in flight, dropped off on one wing and bored majestically and rapidly earthward, whammed into the ground and immediately reduced itself to scrap while poor Uncle Mike stood transfixed in horror, unable to believe his eyes.

Twin pusher of 1911 vintage. Motor stick and rubber motors form "H" as variation on "A-frame" designs. Stab in front, rudder in rear.

Friend, did this discourage Uncle Mike? Did this deter him from building a new model? You are dawggone right it did! He never built another model. S'fact! He wouldn't even discuss modeling until years later! . . .

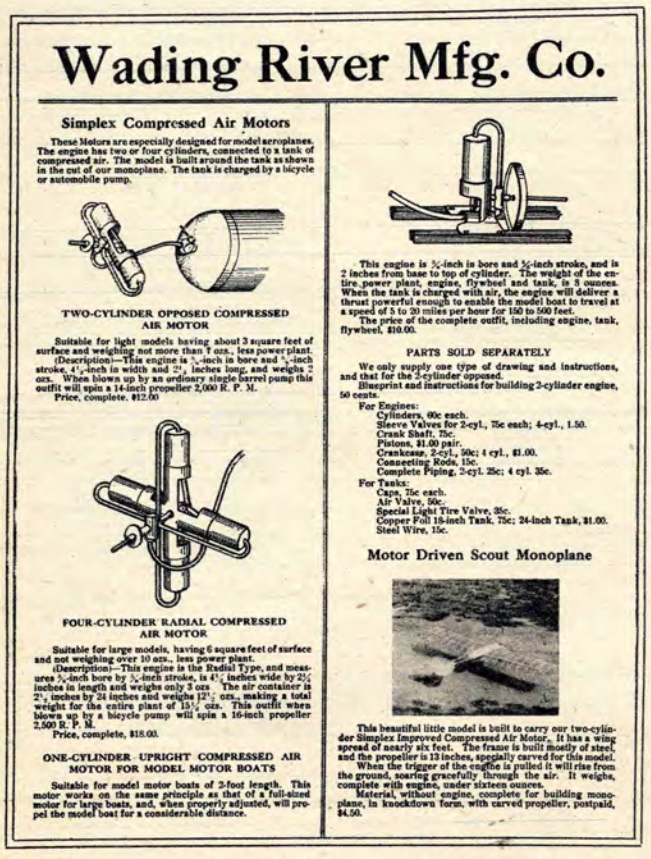
The great days of model building and flying were still to come. There was constant activity down through the years, but it was on a small scale and usually confined to very junior males. Then Lindbergh turned the world upside down in 1927 with his epoch-making flight across the Atlantic. Everyone became aviation conscious; and the model airplane field experienced a resurgence in the boom that followed.

Like violets popping up in the spring, model clubs bloomed all over the country. All types of organizations, from newspapers to department stores, sponsored clubs and meets, and dispersed information relating to the craft. Following in this wake, dozens of new supply houses came into existence.

The bug bit me about this time and I can still recall my first model: a 12-inch R.O.G., designed, I believe, by Merrill Hamburg, Secretary of the Airplane Model League of America, an organization sponsored by the now defunct *American Boy* magazine. Aside from the emergence of balsa as a prime wood for construction purposes, the materials offered at this time had not changed greatly from those offered in Uncle Mike's day; that R.O.G. even had bamboo ribs and wing tips!

After its first successful flight across our living room, I figured I was ready for the big-time. I joined the Junior Aviation League of New York City, sponsored by Gimbels Department Store, and bought a kit of a 35-inch Spad flying scale. It cost me eight bucks, and it was produced by the U. S. Model Aircraft Corporation (successor to the old Wading River Co.).

The blueprint of this job was one-half size; if you wanted accuracy, you drew your own full-size. It was a



Wading River Mfg. Co.

Simplex Compressed Air Motors

These Motors are especially designed for model aeroplanes. The engine has two or four cylinders, connected to a tank of compressed air. The model is built around the tank as shown in the cut of our monoplane. The tank is charged by a bicycle or automobile pump.

TWO-CYLINDER OPPOSED COMPRESSED AIR MOTOR

Suitable for light models having about 3 square feet of surface and weighing not more than 7 ozs., less power plant. (Description—This engine is ¾-inch in bore and ¾-inch stroke, 4½-inch in width and 2½ inches long, and weighs 2 ozs. When blown up by an ordinary single barrel pump this outfit will spin a 14-inch propeller 2,000 R. P. M.
Price, complete, $12.00

FOUR-CYLINDER RADIAL COMPRESSED AIR MOTOR

Suitable for large models, having 6 square feet of surface and not weighing over 10 ozs., less power plant.
(Description—This engine is the Radial Type, and measures ¾-inch bore by ¾-inch stroke, is 4½ inches wide by 2½ inches in length and weighs only 3 ozs. The air container is 2½ inches by 24 inches and weighs 12½ ozs., making a total weight for the entire plant of 15¾ ozs. This outfit when blown up by a bicycle pump will spin a 16-inch propeller 2,500 R. P. M.
Price, complete, $18.00.

ONE-CYLINDER UPRIGHT COMPRESSED AIR MOTOR FOR MODEL MOTOR BOATS

Suitable for model motor boats of 3-foot length. This motor works on the same principle as that of a full-sized motor for large boats, and, when properly adjusted, will propel the model boat for a considerable distance.

This engine is ¾-inch in bore and ¾-inch stroke, and is 2 inches from base to top of cylinder. The weight of the entire power plant, engine, flywheel and tank, is 8 ounces. When the tank is charged with air, the engine will deliver a thrust powerful enough to enable the model boat to travel at a speed of 5 to 20 miles per hour for 150 to 500 feet.
The price of the complete outfit, including engine, tank, flywheel, $10.00.

PARTS SOLD SEPARATELY

We only supply one type of drawing and instructions, and that for the 2-cylinder opposed.
Blueprint and instructions for building 2-cylinder engine, 50 cents.
For Engines:
Cylinders, 60c each.
Sleeve Valves for 2-cyl., 75c each; 4-cyl., 1.50.
Crank Shaft, 75c.
Pistons, $1.00 pair.
Crankcase, 2-cyl., 50c; 4 cyl., $1.00.
Connecting Rods, 15c.
Complete Piping, 2-cyl. 25c; 4 cyl. 35c.
For Tanks:
Caps, 75c each.
Air Valve, 50c.
Special Light Tire Valve, 35c.
Copper Foil 18-inch Tank, 75c; 24-inch Tank, $1.00.
Steel Wire, 15c.

Motor Driven Scout Monoplane

This beautiful little model is built to carry our two-cylinder Simplex Improved Compressed Air Motor. It has a wing spread of nearly six feet. The frame is built mostly of steel, and the propeller is 13 inches, specially carved for this model. When the trigger of the engine is pulled it will rise from the ground, soaring gracefully through the air. It weighs, complete with engine, under sixteen ounces.
Material, without engine, complete for building monoplane, in knockdown form, with carved propeller, postpaid, $4.50.

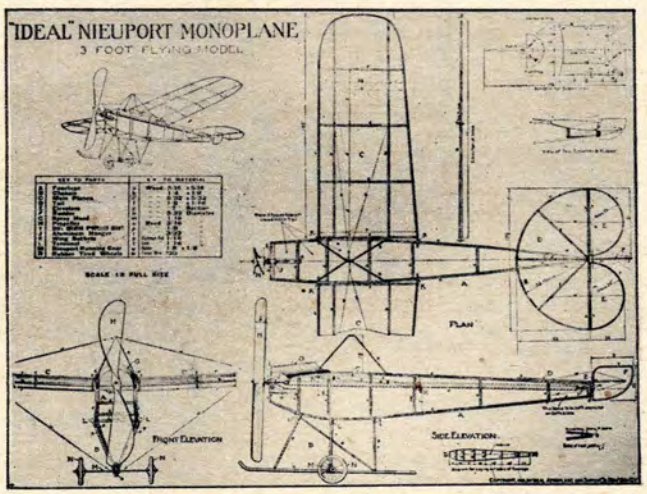
One of the best buys in model motors was offered by the Wading River outfit. A 2-cylinder compressed air job cost $12; the 4-cylinder, $18.

good kit, though. It had die-cut ribs; spruce spars and longerons; rattan for completely encompassing all wing edges, stabilizer, rudder and elevators; an aluminum cowl; hand-carved prop; an assortment of metal fittings, including a brass axle and rubber-tired wheels; thirty-five feet of rubber and additional materials of various sorts.

Small brads were used to join all wood parts, the rattan landing gear legs were lashed and glued to the lower longerons, and the struts were fitted into tiny copper sockets that were cemented to the spars. To bend the rattan into the required shapes, I steamed it and then put it into jigs made from nails sunk into wood planks.

It was a lot of work and a lot of fun, and when it was finally completed and stood on my work table gleaming in its coat of silver dope, I was the proudest guy in seven states.

With a forthrightness born of utter ignorance, I de-



Ideal's Nieuport was companion kit to its Bleriot. Here cowling is called "spray hood"; landing gear is "chassis." Looks like good U/C stunter!

cided to give it an immediate trial flight—without even attempting to discover its gliding angle. Well, the results kind of paralleled the baptismal flight of Uncle Mike's Peoli Racer. I hand-launched it and it climbed briefly and then abruptly fell off on one wing, nosed down and crashed into the ground. It hit awfully hard, because despite the sturdy construction—those U. S. models were rugged and built to take it—it was really damaged in a major way.

An expensive lesson, but part of a modeler's education. In the years that followed, I built other models, and I emphasize the word *built*. One of them was a dream, the Michigan Model Airplane Company's Curtiss Falcon. It had a 24-inch span and flew fairly well. The nose was carved (and hollowed) out of a block of balsa and it could be attached or detached from the fuselage with the aid of four ordinary dress-snaps.

Aside from personally designed models, I also built and flew Ideal's Taube monoplane, Cleveland's Nieuport, National Model Aircraft's tiny Fokker D-8 and Heath Parasol, and several others.

The compressed air motor made some headway during this period. Prices ranged from $3.00 for a two-

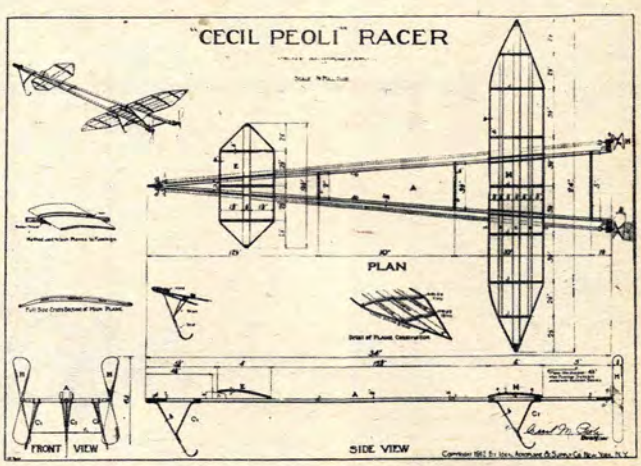
Mike, the Bamboo Thief, or, Caught in the Act!

cylinder model, to $22.00 for an eight-cylinder one. In general, all model kits, designs, and most important of all, scientific research, improved during this era, covering, roughly, 1927-1933. No publication, though, presented the beautiful detailed plans such as you see in today's Air Trails. We were happy to get decent three-views from which we could scale our own plans.

Models were faster, lighter and capable of greater duration than ever before. Of course, model aviation has made tremendous strides in the twenty years that have elapsed since then, except for the replica model. I don't think any of the contemporary models I've seen in this category can compare in detail with some of the non-flying jobs of my time.

Lately I've been toying with the idea of taking up modeling again. I'd like to design and build some models. One thing worries me, though: this business of yo-yoing, Half-A's, glow plugs, crystal control, double crutches, neoprene, etc. These words weren't in the modeler's vocabulary of my day. Will I have to go to engineering school for a couple of years before I commence activities?

Perhaps it would be wiser to build a bamboo Peoli Racer and lash on a couple of those modern petrol engines!



Famous record-holding Cecil Peoli racer kitted by Ideal. Wing and stab leading and trailing edges were reed lashed in place. Twin-pusher had span of 24 in.; the "A-frame" length was 34 in. Small rudders on aft skids.

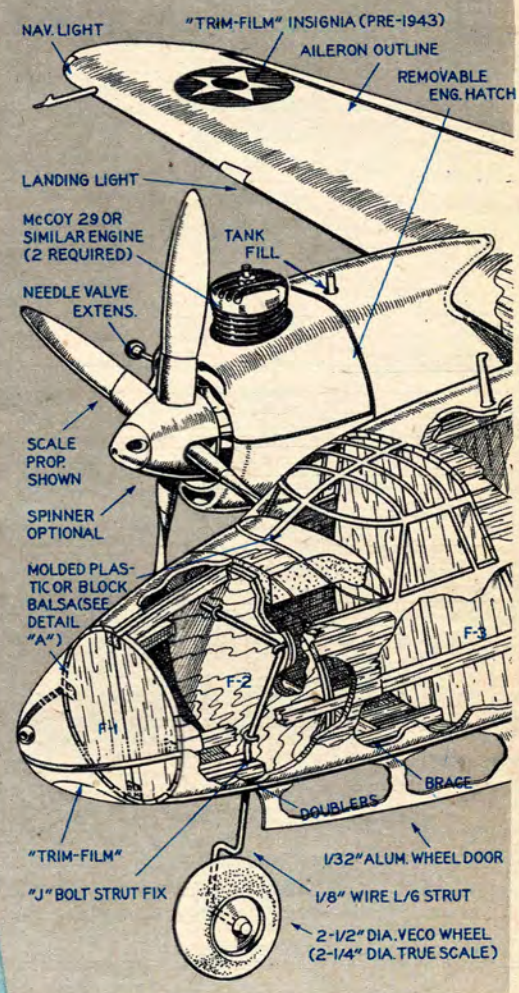
For all the twin-fan fans a real treat: the "Flying Torpedo" of World War II for .29's

■ Remembered as the hottest twin-engine bomber in the last fracas, the B-26 Martin Marauder has the unequaled record of the lowest loss rate in actual combat missions. It is really a maneuverable plane up at 12,000 feet, but on take-offs and landings it had quite a reputation as a "widow factory." As an Air Force Second Looie, I honestly liked the B-26 and piled up more flying hours in this plane than in 20 other types. The plane I flew, I named "Zombie," after one of my favorite free flight designs, and the name fit too!

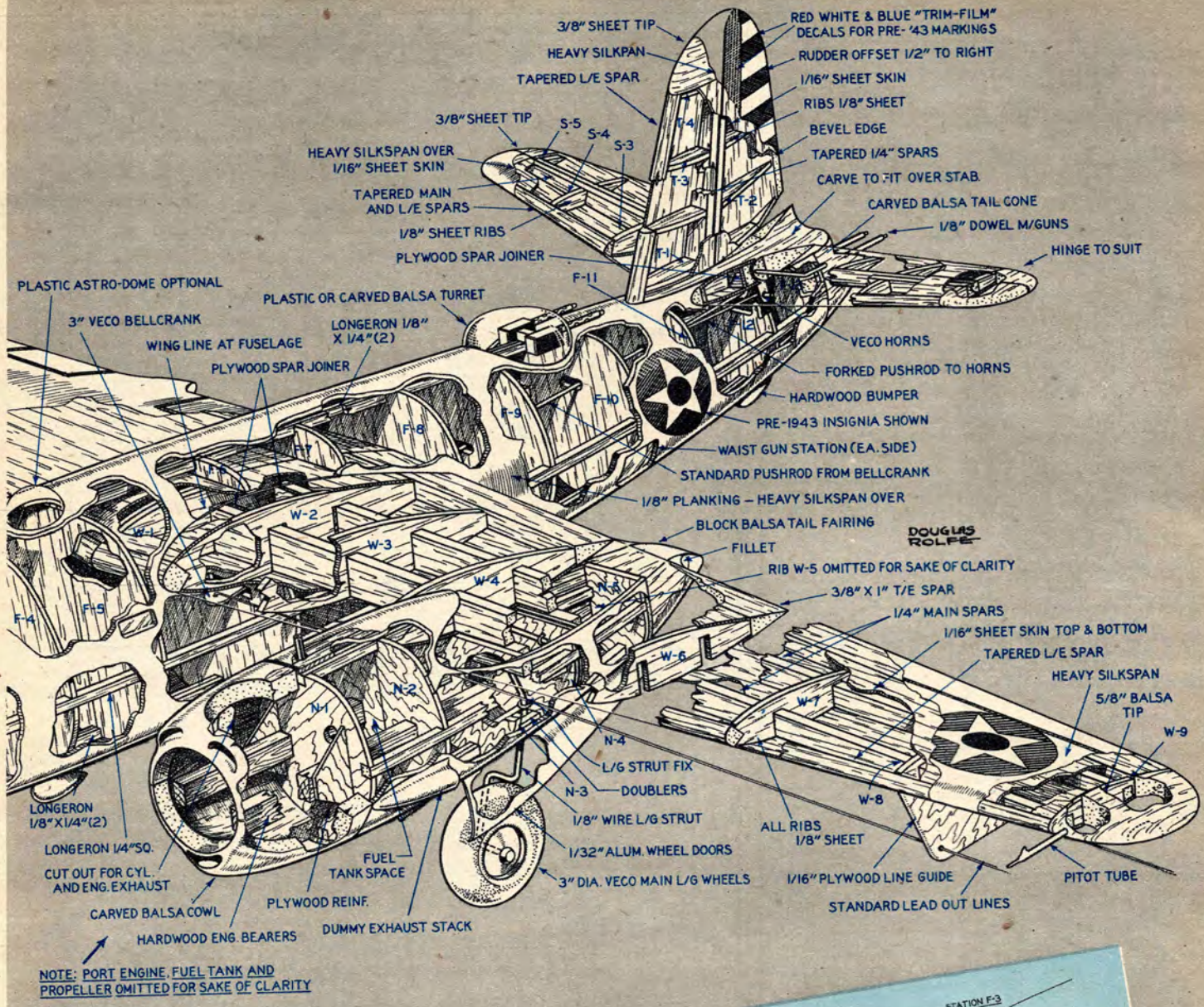
At the time the model was built, I was the "Drone Diesel man," so I powered it with two you-know-what. Later I powered it with two McCoy Sportsman .29 engines—the model flying just a little faster. The scale for the plans was chosen as 3/4" to a foot. The whole plane is simple to assemble and is very sturdy—being covered with sheet balsa; the fuselage is planked. The tricycle landing gear is rugged enough to take the punishment of rough landings that this heavily loaded ship would have to make.

The take-off and landing as well as taxiing characteristics are similar to the real monster. When in the air the plane really tugs on the lines and is capable of doing mild wing-overs and touch-and-go landings. With one engine running at near full rpm's, the model handles quite well and will maintain flight although less sensitive to the controls. Windy weather does not affect the plane too much because of its smooth rounded surfaces. The finished model weighs approximately five pounds ready to fly.

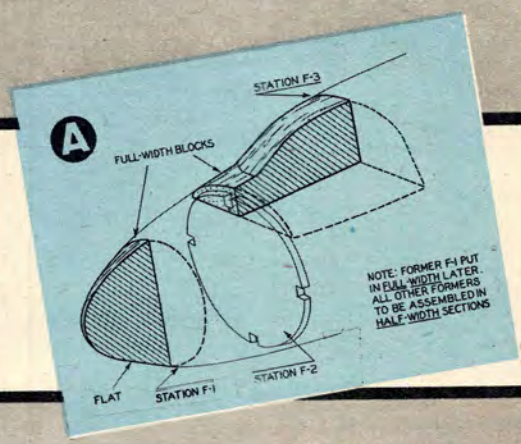
Construction details may be had on the A.T. full-size plans.

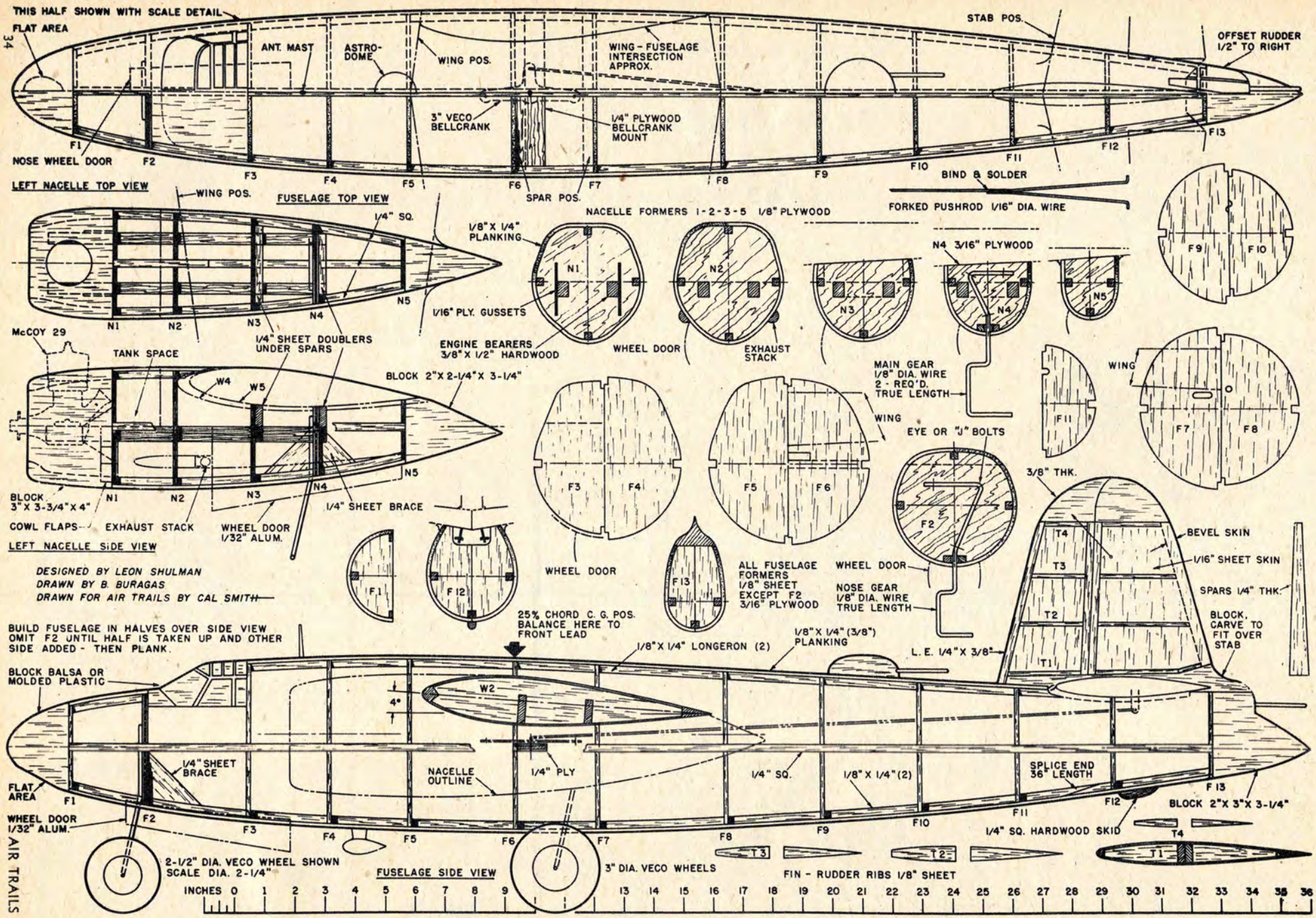


LEON SHULMAN'S **Martin**

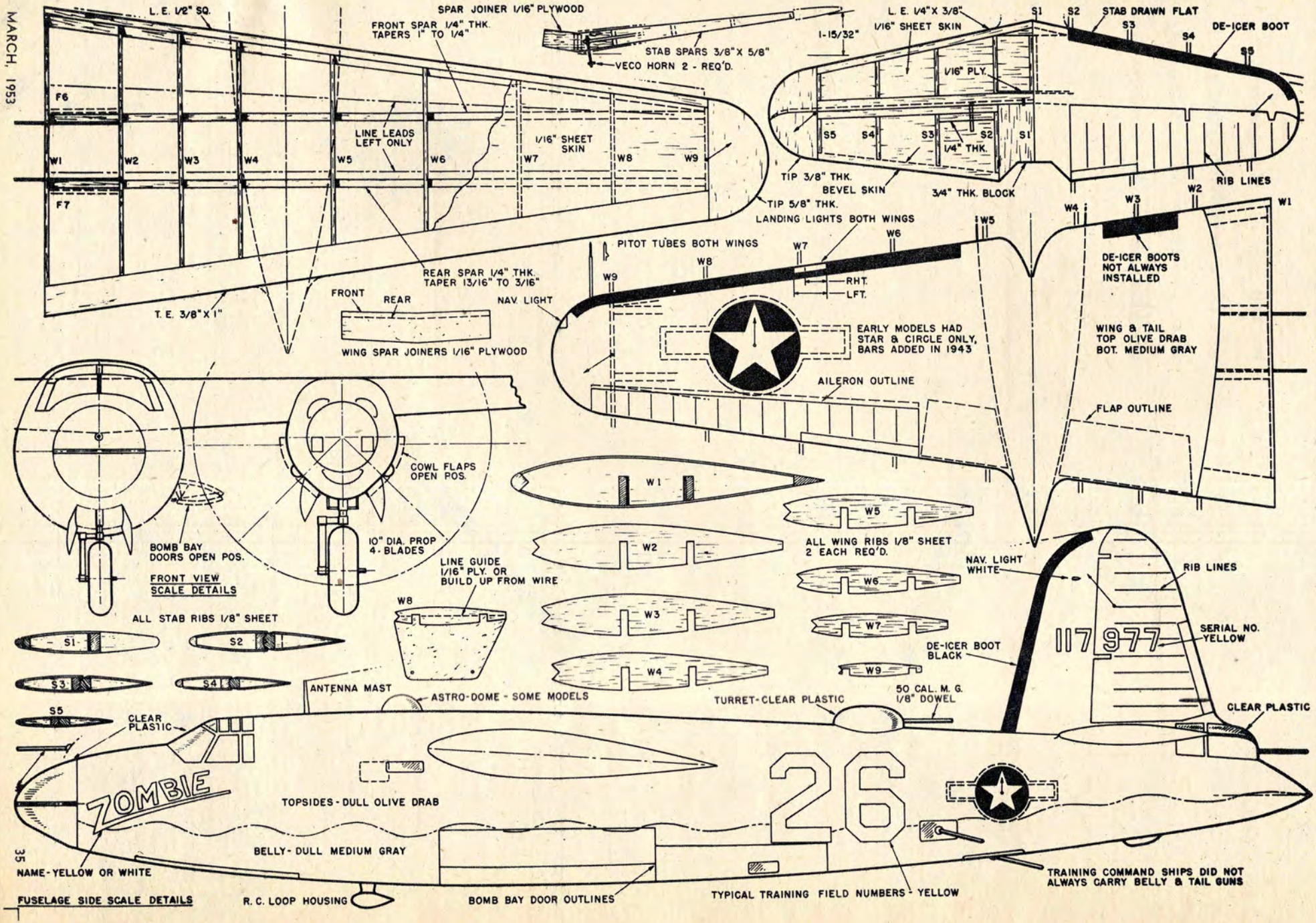


B-26 Marauder

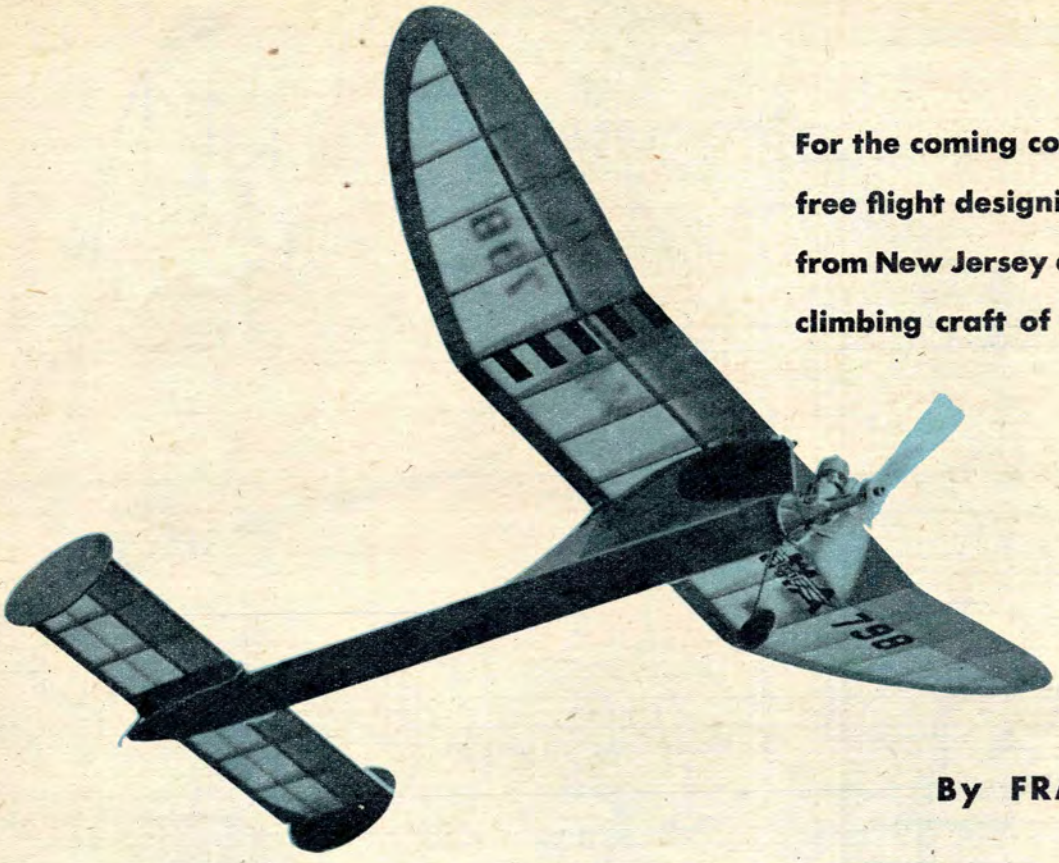




You can enlarge these plans three times for a fine B-26 powered by two .09 engines



Full-size working drawings for twin .29 powered Marauder available from Air Trails



Leapa Lena

For the coming contest season the free flight designing-flying genius from New Jersey offers the fastest climbing craft of his vivid career

By FRANK EHLING

■ There is good reason for the appearance of the pylon on most winning designs, yet the sight of one will drive some model builders away from such a model. With *Leapa Lena*, we hide the pylon in the cabin and produce a model that is more on the realistic side. The cabin was built separately to help the final test flying; the wing can be shifted to obtain a good glide.

Twin rudders help when take-offs are made on rough ground. Flown with engines all the way down to .02, she was really leaping with an .049. The model was weighted with clay to bring it to 7½ oz., and though the glide was fast the climb was sensational.

The Wasp was used with the timer tank. Other engines can utilize an eye dropper for the tank and visual timing employed.

The all-balsa fuselage offers a great deal of strength; with the fuselage set on edge, it can be made smaller and yet fit the engine mounting holes.

The sides are cut from sheet and two L's are made up. To one of these cement the bulkheads; when dry, cement the other L over the bulkheads, forming the complete fuselage. Make up the firewall and the gear and cement in place. Be sure to cement well. Cement bandage around the nose. Add the stabilizer platform and dethermalizer hook.

Cut the cabin bulkheads, tack-cement the lower ones in place, then build up the cabin. Remove the cabin and sheet its sides. The cabin "window" is not cut out, but is indicated with Trim-Film. To trim the lower edges fold a sheet of sandpaper down over the top of the fuselage. Hold it down tight and then take the cabin and slide it back and forth over the paper. The cabin will trim itself to a perfect fit. The top is then trimmed. Add the wing hook to the front of the cabin; cut a hole at the rear—this area should be well cemented.

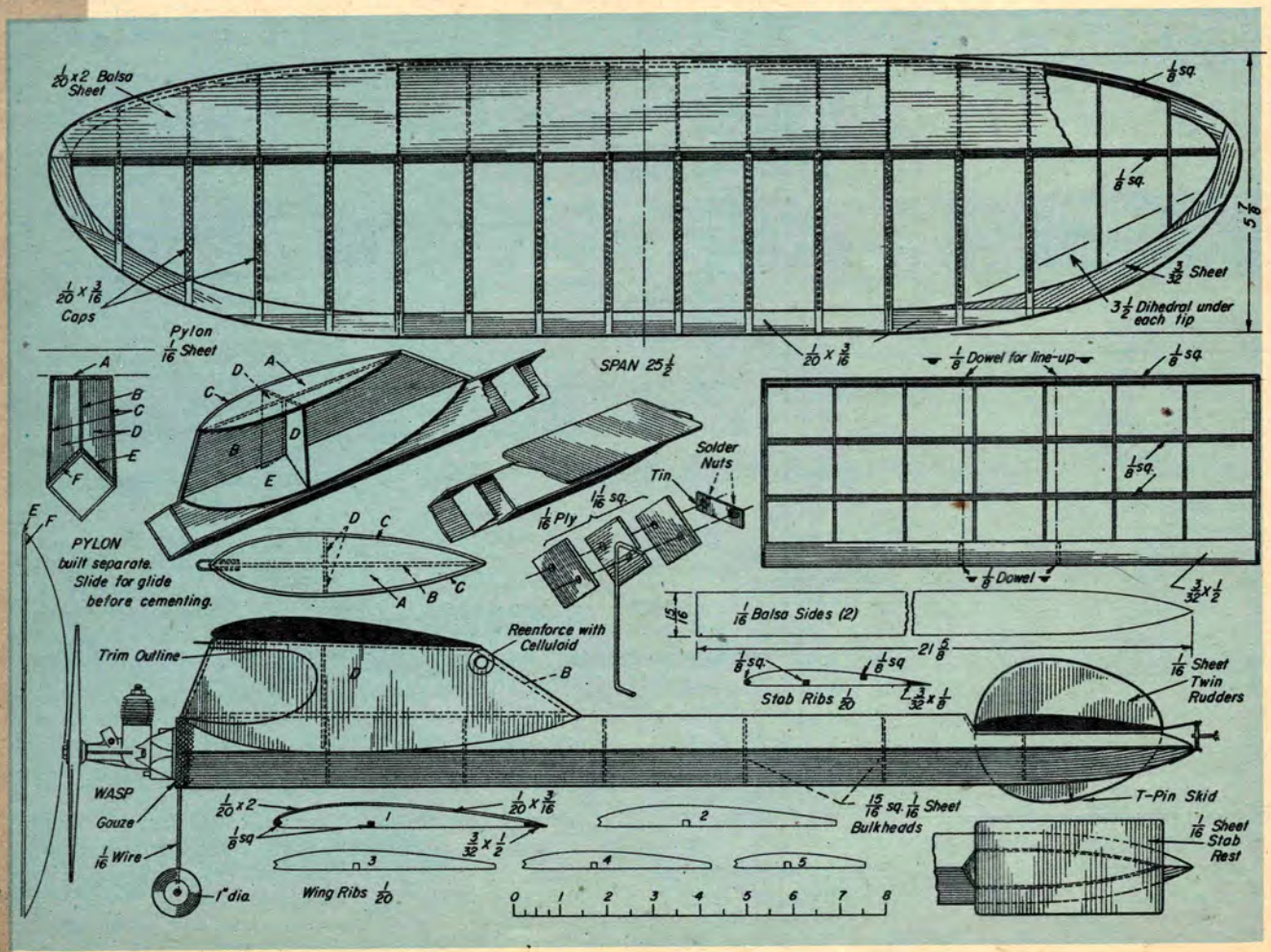
Wing and stabilizer are made in the usual manner; cut out the required ribs and tip outlines. Assemble the three panels over the plan; when dry, these are removed and sheeted separately. Upon drying, edges are trimmed and cemented together with dihedral. Add cap strips to ribs; these extend over the trailing edge and are trimmed with sandpaper. The stabilizer is next, then the rudders are cut and cemented in place. Add the top dethermalizer hook, see that it is directly above the hook on the fuselage.

The model was covered with tissue and doped well to preserve the structure against the hot fuel. We used butyrate dope and sanded between coats. The trimming was done with Trim-Film.

Test flying is done before the cabin is cemented in position; hold the wing and cabin in place temporarily with rubber bands. After the model turns in consistent flights, cement the cabin in proper position.

To obtain consistent flights: Glide the model until a straight glide with a slight "mush" is observed. Fire up and when the engine has about five seconds left, launch the model. Do not throw it, as the model will assume its proper speed and will show its true flight characteristics. The model should be launched at 40 degrees. If it turns tightly to the right and the glide circle is large, tilt the stabilizer (looking from the rear) so the right tip is lower than the left. Repeat the flight and if the power (*Continued on page* 74)

To make life easy try this trick—use AT's plans, then construction's quick! (See listing in this issue.)



AIR-MODEL MANUAL

glossary of R/C terms & symbols

BANDS MOST USED FOR R/C

26.960-27.230 mc. (Novices & Hams)
27.255 mc. ± .04% (anyone with proper station license and crystal-controlled trans.)*
50-54 mc. (licensed Hams only)
465 mc. (anyone with proper station license and *F.C.C. Approved* transmitter).*

* no test of any sort required

STANDARD DESIGNATIONS of our parts of the FREQUENCY SPECTRUM

3-30 mc.—high frequency (HF)
30-300 mc.—very-high frequency (VHF)
300-3,000 mc.—ultra-high frequency (UHF)
Frequency and wavelength both often used; megacycle—mc.—is 1,000 kilocycles (kc.).

OTHER COMMON TERMS

Ohm—unit of resistance (for resistors)	Ω
Megohm—1 million ohms	Meg
Volt—unit of potential	V (or E, in formulas only)
Ampere—unit of current	A (or I, in formulas only
Milliampere—one thousandth of ampere	ma
Radio frequency choke	RFC
Watt—unit of power	W
Microfarad—unit of capacity (for condensers)	mf (called "mike" for short)
Micro-microfarad—one millionth of a microfarad	mmf (called "micro-mike")
Thousand—as used in designating resistor	K
Inductances (coils, transformers, chokes) are indicated on diagrams by	L

In formulas, R represents resistance (ohms or megohms) and C represents capacity.

SIMPLE FORMULAS

Changing frequency to wavelength: λ (wavelength in meters) $= \frac{300}{f \text{ (freq. in mc.)}}$

Ohms law: Volts=Current (in amperes) times Resistance (in ohms)—or E=IR. Also may be written

$$R=\frac{E}{I} \text{ and } I=\frac{E}{R}$$

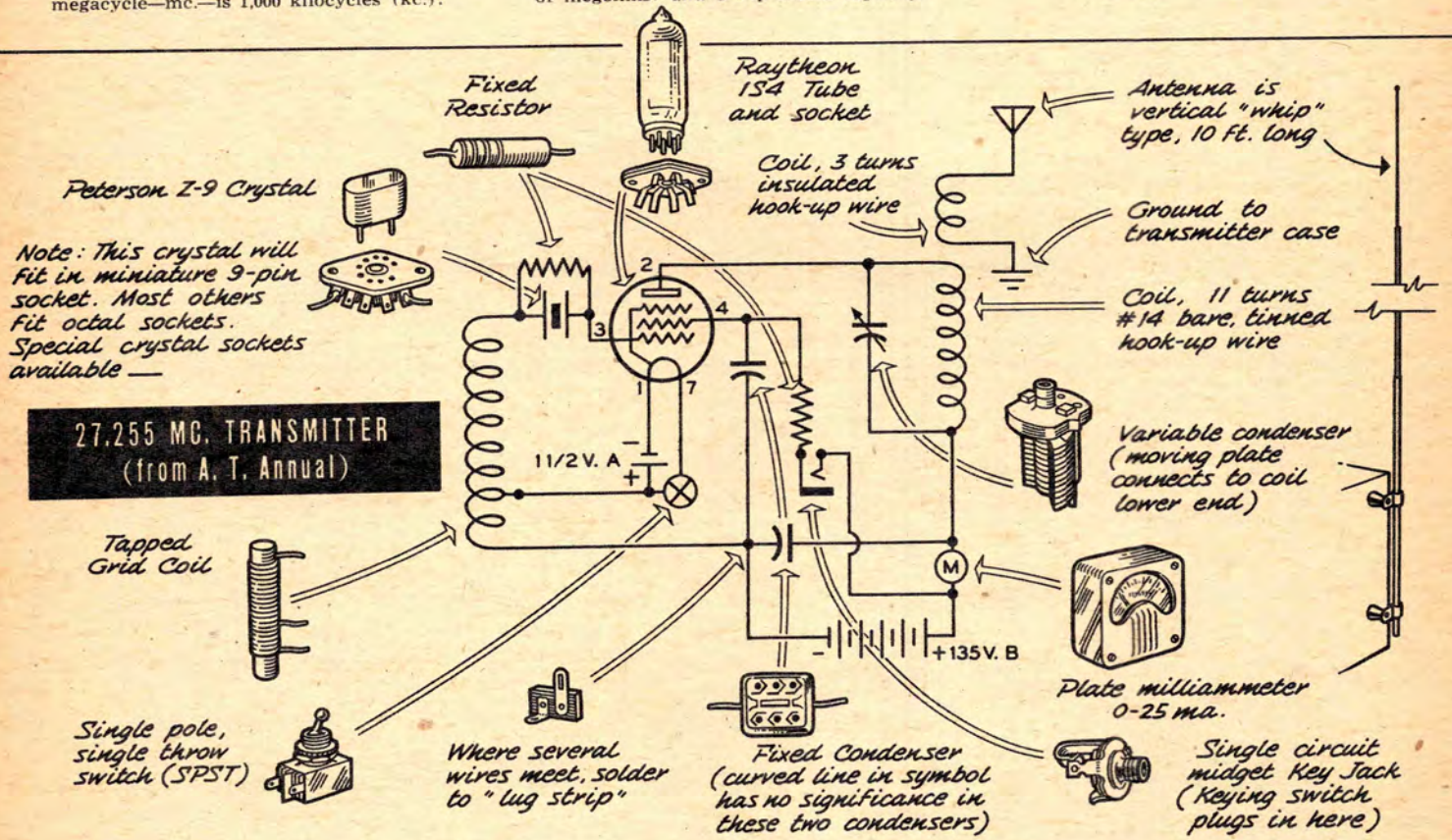
Watts: W=EI. (Always use volts, amperes, ohms in these 4 formulas.)

Resistors, connected in:

Series	Parallel
$R=R_1+R_2$	$R=\frac{R_1 \times R_2}{R_1+R_2}$

Condensers, connected in:

Series	Parallel
$C=\frac{C_1 \times C_2}{C_1+C_2}$	$C=C_1+C_2$


Fixed Resistor
Raytheon 154 Tube and socket
Antenna is vertical "whip" type, 10 Ft. long
Peterson Z-9 Crystal
Coil, 3 turns insulated hook-up wire
Ground to transmitter case
Note: This crystal will fit in miniature 9-pin socket. Most others fit octal sockets. Special crystal sockets available —
Coil, 11 turns #14 bare, tinned hook-up wire
27.255 MC. TRANSMITTER (from A. T. Annual)
11/2 V. A
Variable condenser (moving plate connects to coil lower end)
Tapped Grid Coil
+135 V. B
Plate milliammeter 0-25 ma.
Single pole, single throw switch (SPST)
Where several wires meet, solder to "lug strip"
Fixed Condenser (curved line in symbol has no significance in these two condensers)
Single circuit midget Key Jack (Keying switch plugs in here)

Radio control is becoming more popular every day, but many "recruits" are puzzled by the odd terms used, the circuit diagrams and symbols. We show here a collection of such data, facts and terms the uninitiated will encounter. Also included are wiring diagrams of typical transmitter and receiver, showing both the item used and the circuit symbol for it.

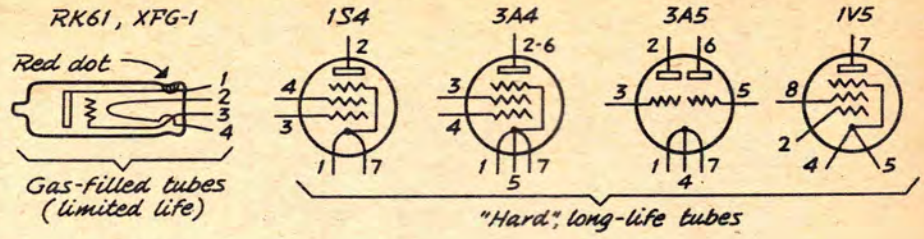
Many resistors and condensers are color-coded instead of having the actual value printed on them. The resistor code is quite simple and will be found in only two forms, of which the most widely used is shown. Condenser codes are trickier and it's wise to try to get these components with the value printed on them. We give the most common codes here; note that the same colors designate the same figures in both condensers and resistors.

The most common resistors are 20% tolerance, that is, the resistor you purchase may be as much as 20% different in value than you ask for. In most of our circuits this makes little difference. Resistors also come with a silver band (10% tolerance) and a gold band (5% tolerance) at somewhat higher cost. Most modern

The "Manual" brings you helpful information on all phases of aeromodeling and is dedicated to the beginning enthusiast. Tell us what subjects you'd like covered

MOST WIDELY USED R/C TUBES

Always read tube and socket leads clockwise looking at bottom —

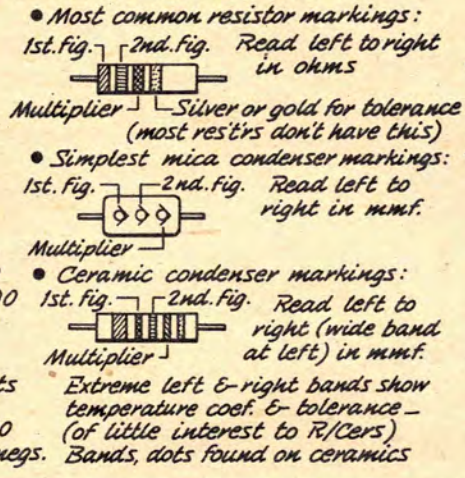


STANDARD COLOR CODE FOR RESISTORS AND CONDENSERS

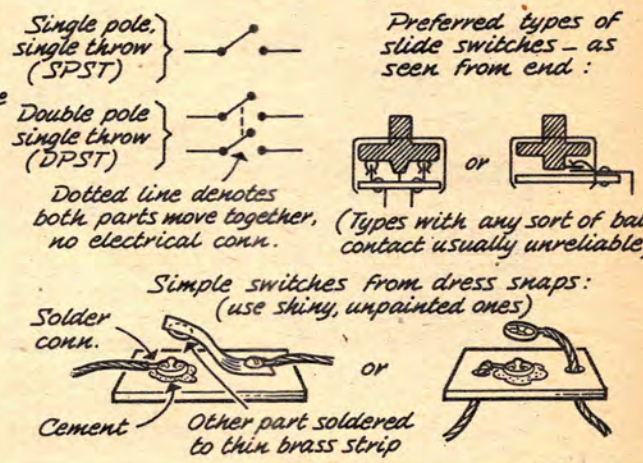
COLOR	FIGURE	MULTIPLIER
Black	0	1
Brown	1	10
Red	2	100
Orange	3	1000
Yellow	4	10000
Green	5	100000
Blue	6	1000000
Violet	7	10000000
Gray	8	100000000
White	9	1000000000

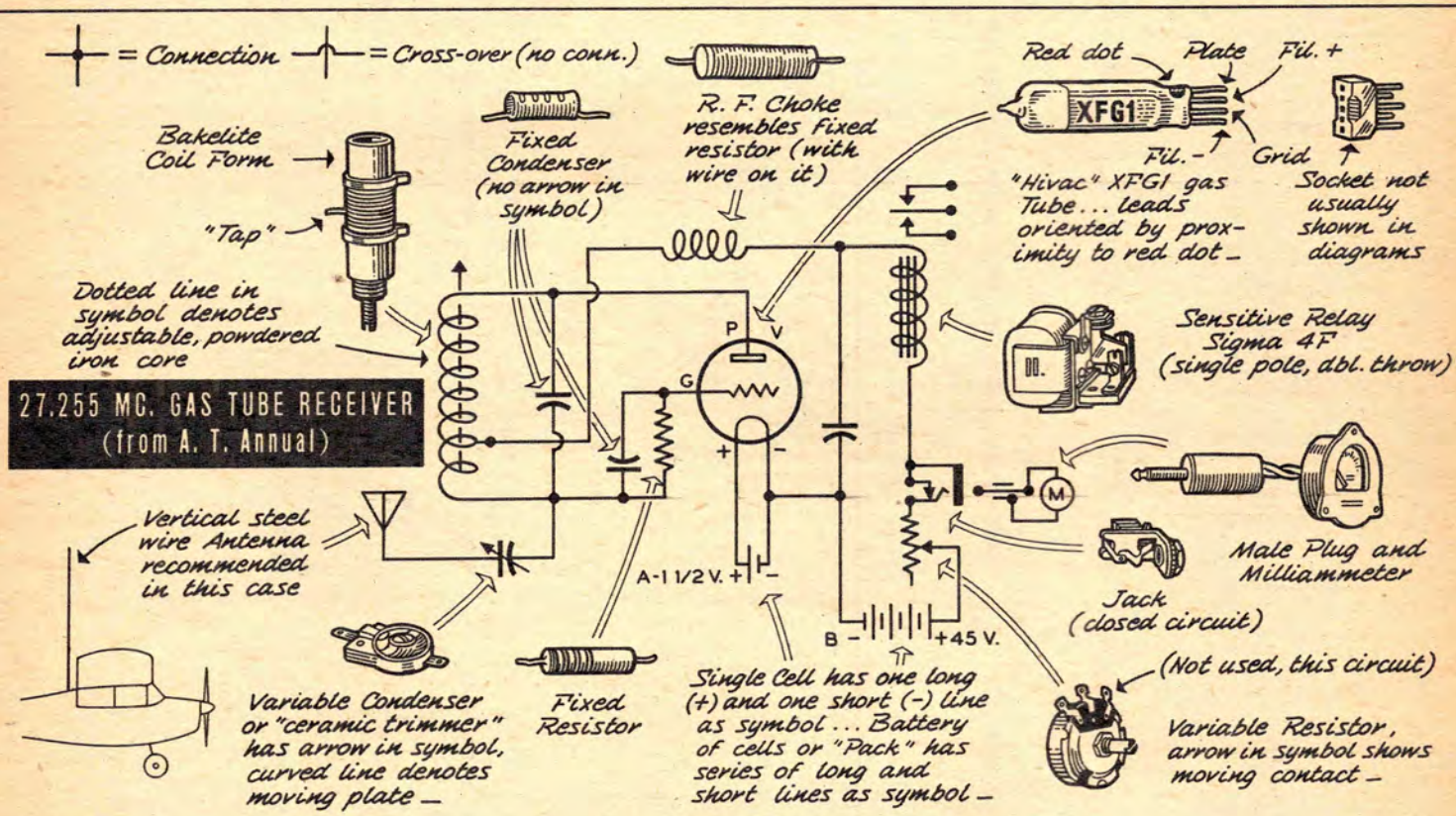
Examples:

- Brown, green, red rings or dots on cond., 1500 ohms
- Yellow, violet, orange - 47000
- Orange, orange, green - 3.3 megs.


• Most common resistor markings:
1st. Fig.
2nd. Fig.
Read left to right in ohms
Multiplier
Silver or gold for tolerance (most res'trs don't have this)
• Simplest mica condenser markings:
1st. Fig.
2nd. Fig.
Read left to right in mmf.
Multiplier
• Ceramic condenser markings:
1st. Fig.
2nd. Fig.
Read left to right (wide band at left) in mmf.
Multiplier
Extreme left & right bands show temperature coef. & tolerance — (of little interest to R/Cers) Bands, dots found on ceramics

SWITCHES


Single pole, single throw (SPST)
Double pole single throw (DPST)
Dotted line denotes both parts move together, no electrical conn.
Preferred types of slide switches — as seen from end:
or
(Types with any sort of ball contact usually unreliable)
Simple switches from dress snaps: (use shiny, unpainted ones)
Solder conn.
Cement
Other part soldered to thin brass strip
or


= Connection
= Cross-over (no conn.)
R. F. Choke resembles fixed resistor (with wire on it)
Fixed Condenser (no arrow in symbol)
Bakelite Coil Form
"Tap"
Dotted line in symbol denotes adjustable, powdered iron core
27.255 MC. GAS TUBE RECEIVER (from A. T. Annual)
Red dot
Plate
Fil. +
XFG1
Fil. -
Grid
"Hivac" XFG1 gas Tube... lead's oriented by proximity to red dot —
Socket not usually shown in diagrams
Sensitive Relay Sigma 4F (single pole, dbl. throw)
P
V
G
+
-
A-1 1/2 V.
B -
+45 V.
Single Cell has one long (+) and one short (-) line as symbol... Battery of cells or "Pack" has series of long and short lines as symbol —
Vertical steel wire Antenna recommended in this case
Variable Condenser or "ceramic trimmer" has arrow in symbol, curved line denotes moving plate —
Fixed Resistor
Male Plug and Milliammeter
Jack (closed circuit)
(Not used, this circuit)
Variable Resistor, arrow in symbol shows moving contact —

resistors have rather odd values—33,000, 470,000, 2.2 megs, etc. If you want to duplicate a circuit that has more even values, just pick the nearest ones from the standard RMA values that most radio stores now carry—you will probably be close enough.

Of thousands of tubes on the market, R/Cers use only two or three; these are shown pictorially. Get into the habit of numbering the leads of tubes when you draw diagrams—then you won't have to look them up every time you refer to the circuit.

Try to put down brief notes of results you get with various circuits; record plate current, plate voltage, current change you got with receivers, potentiometer settings, placement of antenna coupling coil in the transmitter. Note down the approximate range you can get with a new receiver or transmitter. Keep track of the number of turns you can put in the escapement rubber, the area and range of movement of the rudder. You'll find these records invaluable as you progress through R/C work.

Radio amateurs' handbooks, sold by most large radio stores and mail order houses, will furnish additional info.

National Champion Joe Foster with PAA-Load job

THE BIG MEETS IN REVIEW:

The Weight Lifters

Top interest in free flight activities at the National Meet was shared equally by the rise-off-water event and the Pan American payload categories. Here are some of the PAA-Load and Clipper Cargo characters in action. Champ Foster used a K&B for his Half-A weight lifter; Tyler's wing spanned 6 feet, used Wasp, carried 12 oz. on 1st flight; Mooney's low-winger diesel flew very nicely; Water used a K&B .19 in his model; Herb Kothe's 410 sq. in. Cargo entry had over-run problems; Bauer flew with Mills Diesel in his V-tail 6 ft. cargo model; Dr. Stan "Amazon" Hill had real show-stopper in his cargo-carrying "plank" which later cracked up; Uyematsu won AB PAA-Load but had over-run in cargo; that's Yvonne Latham with Bob and his Cl. A PAA-Load.

Photos by H. A. THOMAS, FUDO TAKAGI & PAN AMERICAN WORLD AIRWAYS

Paul Gilliam & Civy Boy 61

Walt Mooney, San Diego

John Tyler's Clipper Cargo

William R. Water, Topeka

Topeka's C.O. Wright & Cl. A

Kothe's Clipper Cargo

Andy Bauer, Long Beach

Carol Mooney & Coolie hat

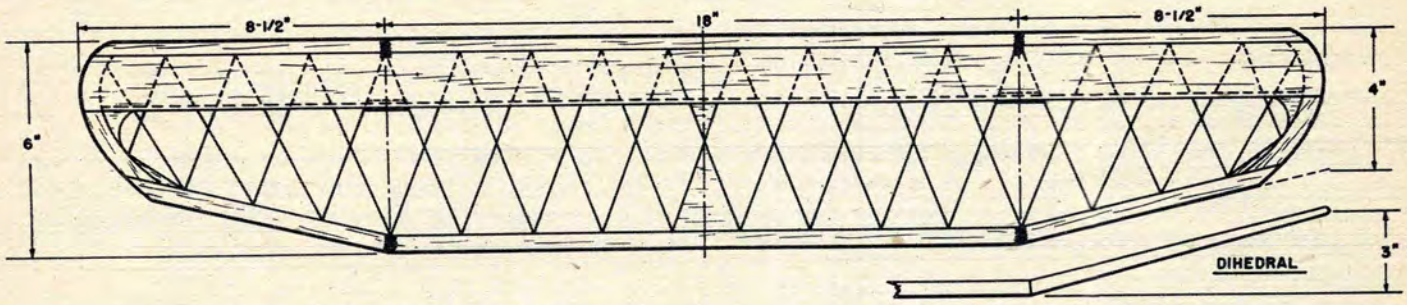
Ed Mate, Chicago

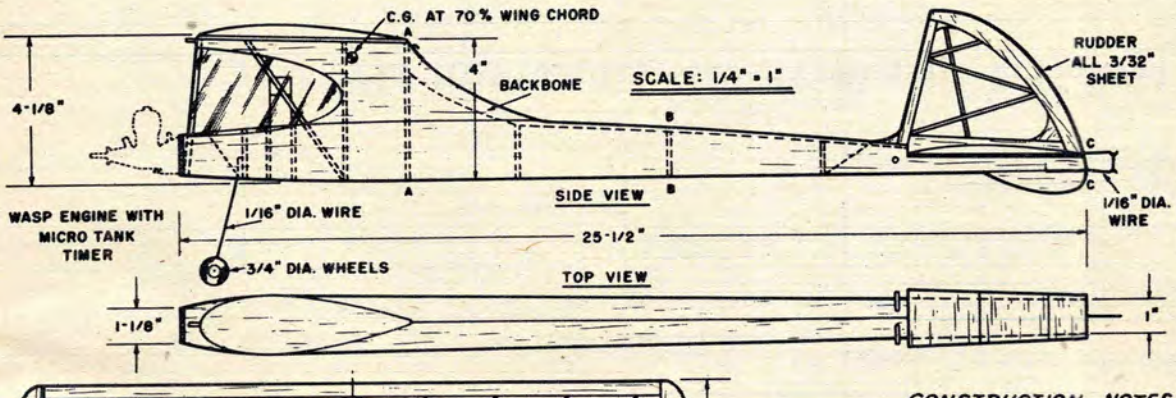
Doc Hill & Cargo wing

Fran Uyematsu & Cargo job

Cargo winner Robert Latham, Dallas

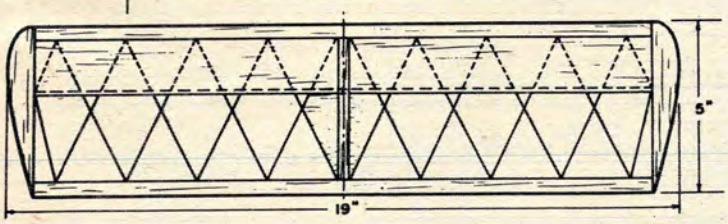
PAA-LOADER FROM MEXICO by Alberto Vela. Turned in 8:20 on 18 second run on first flight at Nationals. Has never done less than 5 minutes on 17 second motor run back in the home country from strict ROG. One of the most beautifully finished free flights at Los Alamitos, it attracted considerable attention.





TYPICAL FUSELAGE CROSS SECTIONS

SOLDER NUTS TO METAL STRIP ON REAR OF FIREWALL



CONSTRUCTION NOTES

Wing Construction: Ribs 1/16" sheet, Leading Edge 1/2", Trailing Edge 5/8", Leading Edge Planking 1/32" medium hard, Tips 1/8" sheet, Two Spars 1/8" sq., Dihedral braces 1/32" plywood, cloth gauze strips at all dihedral breaks. Jap tissue covered, 10 coats of clear dope. Stabilizer Construction is same as the wing Fuselage: 1/16" sheet sides and bottom, 3/32" sheet formers, 1/16" hard sheet backbone, 1/16" sheet stab. rest, 1/8" sheet wing rest.

FULL SIZE WING & STABILIZER SECTIONS

For modelers who want the best!

TESTORS *Branded*

BALSA

This superior-quality balsa comes to you from the jungle forests of Ecuador, Costa Rica, and other areas of the tropical Americas. We purchase it on special order from the world's largest balsa producer* . . . have it hand-selected to our exact specifications right at the point of shipment. When received at our plant, it is processed with exacting care. Final preparation of each individual sheet, strip, and plank includes *triple-sanding and buffing* . . . which makes Testors Branded Balsa the *only* line on the market so perfectly finished ready for you to use! Be sure to ask for Testors — by *name*. You will find it unequalled for luster, uniformity, smooth grain, correctly graded hardness . . . .

*International Balsa Corporation

A COMPLETE LINE OF SHEETS, STRIPS AND PLANKS

WIDTHS

Thickness	1/16"	3/32"	1/8"	3/16"	1/4"	3/8"	1/2"	1"	2"	3"	4"	6"	Thickness
1/32"									$0.10	$0.16	$0.25	$0.50	1/32"
1/16"	5/5c	5/5c	4/5c	4/5c	3/5c	2/5c	$0.03	$0.05	.10	.16	.25	.50	1/16"
3/32"		4/5c	3/5c	3/5c	2/5c	.03	.04	.06	.12	.18	.25	.55	3/32"
1/8"			3/5c	3/5c	2/5c	.03	.05	.08	.15	.20	.30	.60	1/8"
3/16"				2/5c	.03	.04	.06	.10	.18	.25	.35	.65	3/16"
1/4"					.04	.05	.07	.12	.20	.30	.40	.70	1/4"
3/8"						.07	.09	.16	.25	.40	.50	.90	3/8"
1/2"							.11	.20	.30	.50	.65	1.10	1/2"
1"								.40	.60	1.00	1.30	2.00	1"
2"									.96	1.44	1.92	2.88	2"
3"										2.16	2.88	4.32	3"

All prices are for 36" lengths.

TESTOR CHEMICAL COM

INSIST ON THESE OTHER TESTORS MODEL SUPPLIES, TOO... *by name!*

TESTORS MODEL AIRPLANE CEMENTS

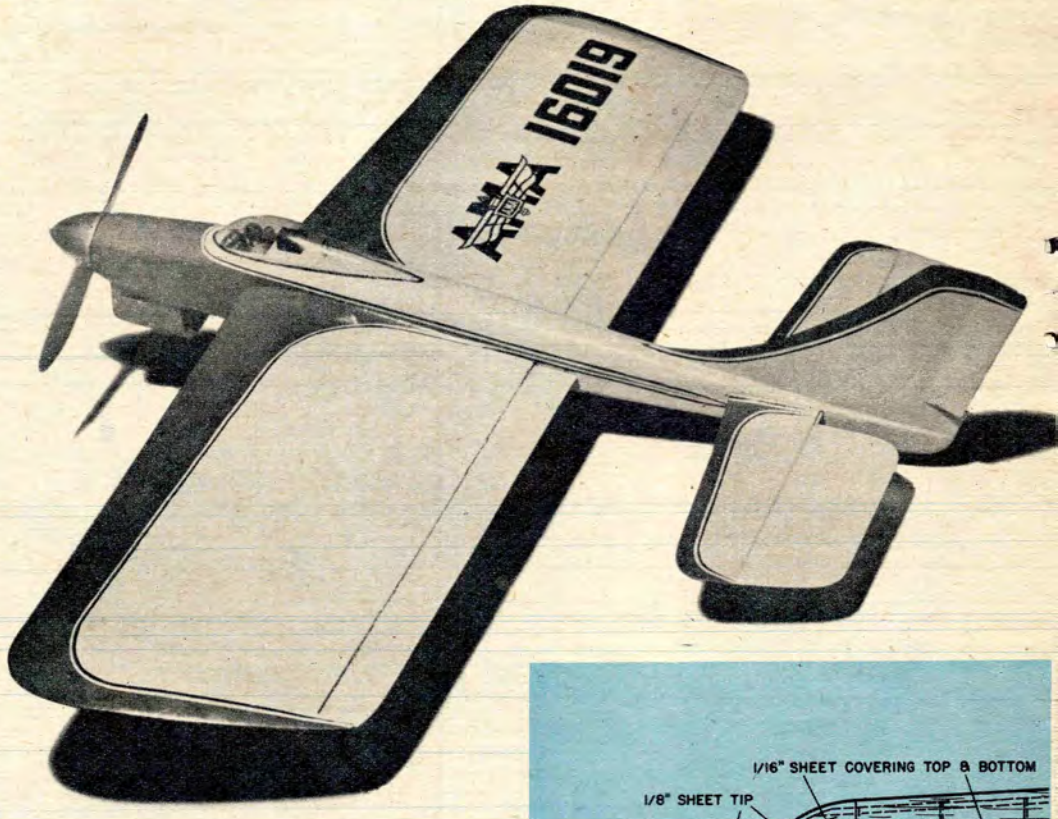
"39" MODEL ENGINE FUEL

TESTORS DOPE

STA HOT FUEL PROOF FINISH

OMPANY • ROCKFORD, ILLINOIS

INTERNATIONAL STUNT CHAMP



By **LLOYD W. CURTIS**
WINNER OF AIR TRAILS PERPETUAL TROPHY

Top Aerobatic ace at Plymouth's 6th Internationals

■ If you want a realistic-looking model that will stunt like crazy, this is it. This model won the Air Trails Stunt trophy at Plymouth's big sixth International meet. Its realistic appearance and clean lines also won a high position in appearance points. The original model was cream with red trim and a black pin stripe. It has a combination of features from many other history-making stunt planes.

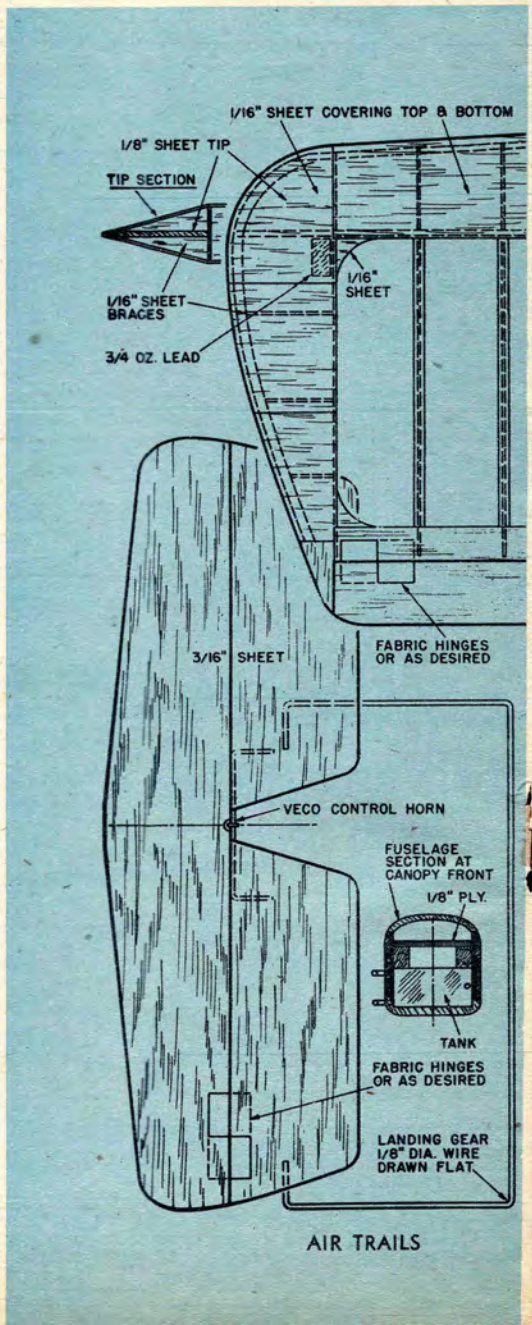
Flying this model is a real challenge to any stunter. It has a lot of tail and flap movement for sharp corners and if you ease her around with a steady hand it is very smooth. With the landing gear in the wing and a turnable tail wheel this plane has always responded to an almost perfect take-off and landing. By doing an inside loop, when the tank is about dry, you can cut the engine any place in the circle and land it right in the judges' laps.

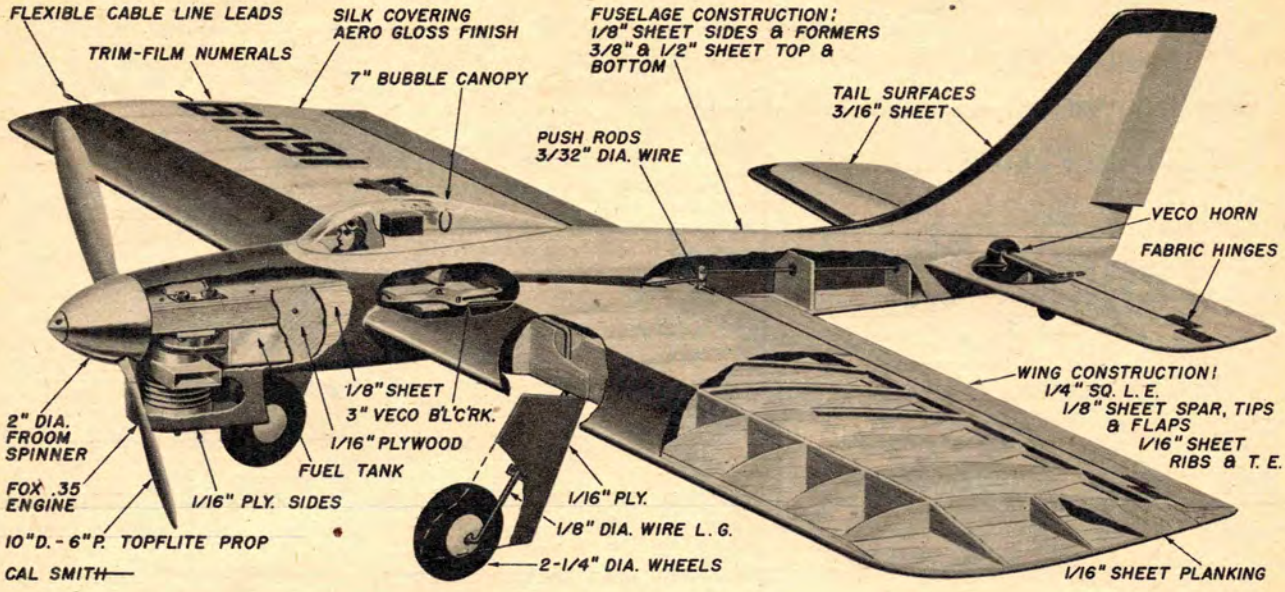
Landing this plane is an art. Because of its weight, after the motor cuts it glides very fast. If you ease her down slowly and touch the front wheels first, instead of all three, you can get a very realistic looking landing. This plane can really take the rough treatment too. It is *built* to "take it."

Construction begins with the wing. Cut the main spar from medium hard ⅛" sheet balsa. The top is straight but the bottom is tapered to produce a slight angle of dihedral. The plywood reinforcement pieces for the spar are from 1/16" sheet plywood and glued onto the spar. Mark off where the ribs will be glued on both sides of the spar, and cut hole for bellcrank. The ribs are all 1/16" sheet. Make plywood forms of the biggest and smallest ribs and then cut out as many pieces, a little larger than the ribs, of 1/16" sheet as there are ribs.

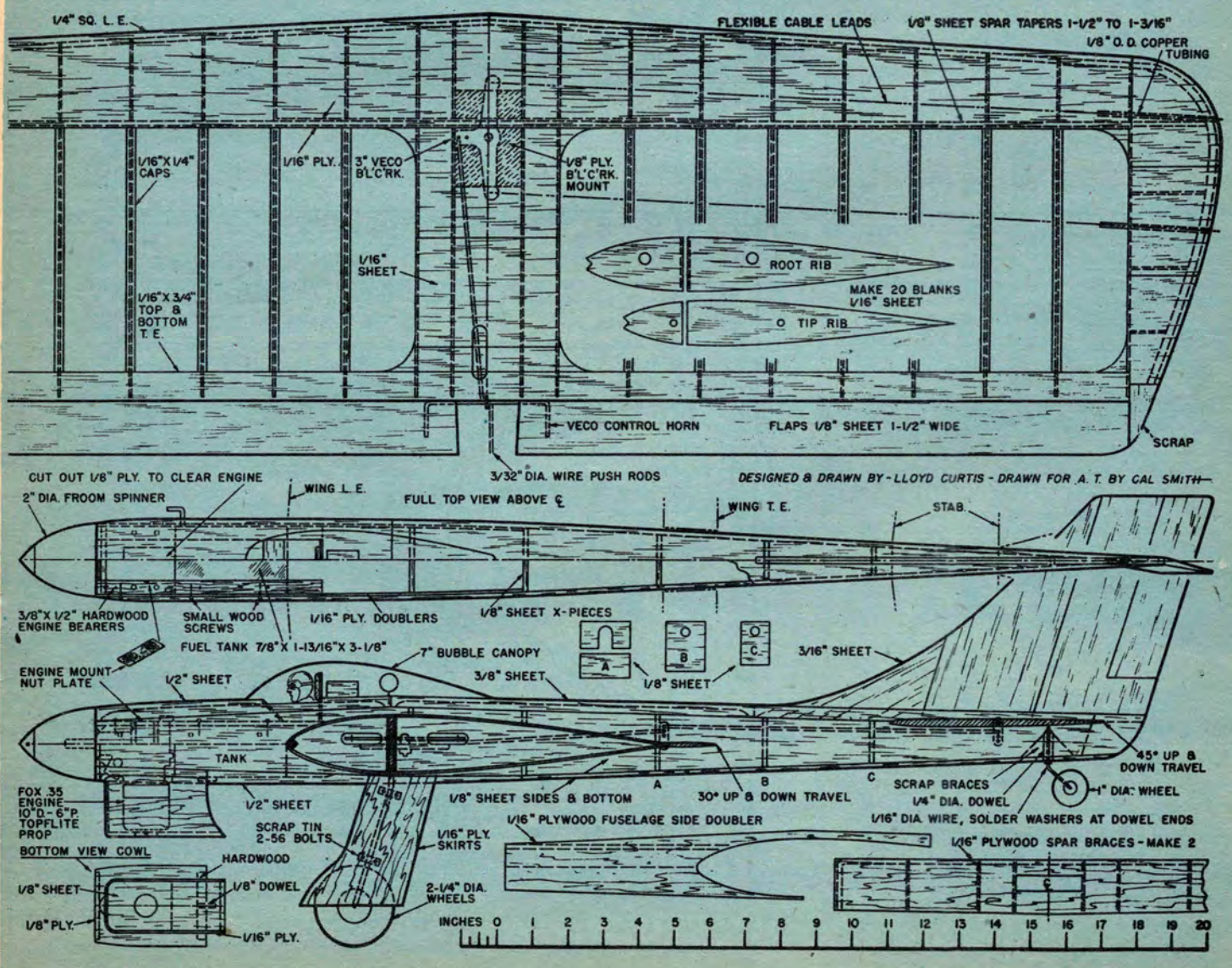
Then stack as follows. One plywood form of smallest rib, next 1/16" sheets, then plywood form of largest rib, then 1/16" sheets, then plywood form of smallest rib. Clamp them all together, carve them out and sand. Saw the stack in two on the line where the spar will be. Cut 1/16" off from both edges of the center ribs to make up for 1/16" plywood reinforcements. Cut holes in inside wing ribs for leadout wires.

(*Further construction details will be found on A.T. full-size plans.*)





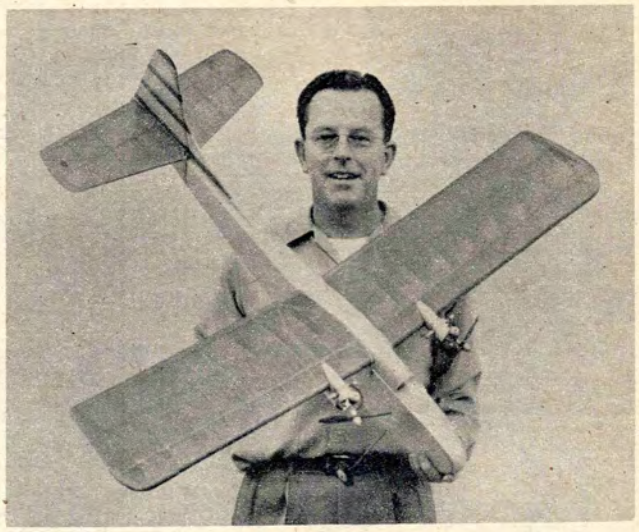
Full-size working drawings of Curtis' International Stunt Winner available from Air Trails' full-size plan dept. (35c).



Anything difficult about twin-engine free flights? Nothing at all, says this West Coast expert, providing you watch your engine offset

Taming the Twins

By KEN WILLARD



The author, a "wheel" at the Marquardt Aircraft Company, makers of ram-jet engines, with the offset twin he used to develop F/F theory.

■ One memorable day I had the unnerving experience of watching an enthusiastic model builder unload a beautiful twin-engine free flight model from his car, take it out on the field, test glide it (beautiful glide!), fill it up with fuel, get both engines running nicely at the same speed, give or take a few revs, then launch it. What happened? You guessed it—about ten seconds after the launch one engine quit, and *zowerow!* With one engine dead, that model spiral-dived so fast that we hardly had time to flinch before all that was left was a major rebuilding job.

You never saw a model builder lose his enthusiasm so fast, either. With a mournful "I'm through with twin-engine jobs," he picked up the pieces and departed—probably to return to building the usual conventional job.

Not long after that, at another model field, I watched a repeat performance, this time by another model builder. Same deal, but different cause. For the engine failure, that is. The spiral dive was caused by the same force—one engine continuing to run and pulling the model into the spiral dive.

That did it. I decided to build a twin engine job—but one that would work. Now I don't like to crack up a model any more than you do, so I figured that if I found out why these fellows had such bad luck, maybe I could avoid their difficulties.

First step in the "basic research" was to list the twin engine systems and their drawbacks. There weren't many types; here are the principal ones:

1. A central fuel tank in the fuselage with long fuel lines leading out to the engines.

2. Independent fuel systems for each engine, with an independent set of fuel shutoffs timed to make the engines stop simultaneously.

3. Independent fuel systems for each engine with a single cutoff system which shuts off both engines simultaneously.

Each system had a weakness; the first system would starve one engine and flood the other when the model was in a turn; the second system was subject to irregularities in the individual timers; the third system was the best of the lot, but, as you all know too well, most small engines at one time or another are subject to stopping, even though the fuel flow isn't shut off, for any one of a number of reasons—either the mixture isn't right, or the fuel line clogs up, or the plug fouls or gets weak, etc.

At any rate, (*Continued on page* 56)

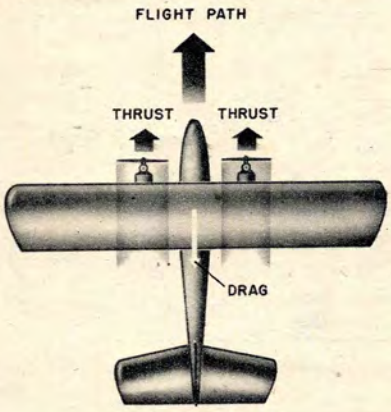


FIG. 1

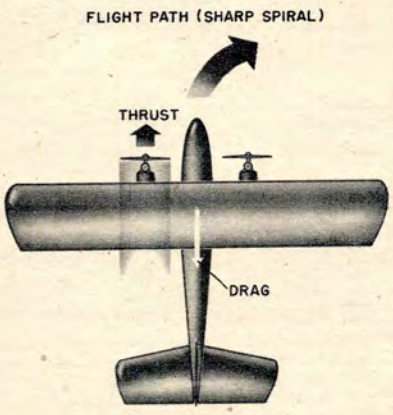


FIG. 2

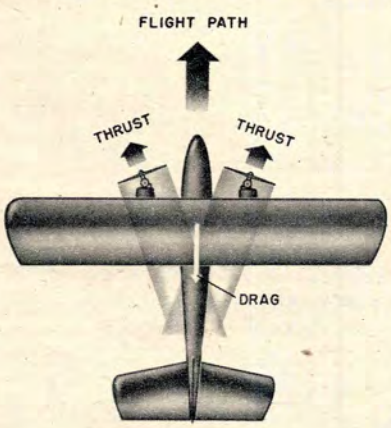


FIG. 3

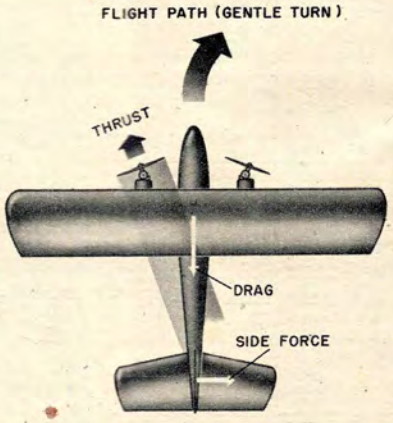


FIG. 4

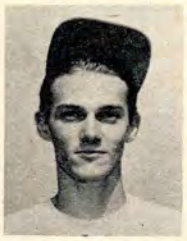
We'd Like You to Meet...

More modelers whose designs you've read about for years . . . Now for the men themselves

Wallis Rigby . . . If any of our readers have purchased those books of cut-out paper models that have often been seen on the newsstands, chances are good that Brother Rigby had something to do with the design. He was an English model building pioneer, and believes he was making and flying successful gliders at the same time as the Wright Brothers, though neither of them knew about the other. This was when he was only about 7 years old, and had accidentally hit upon the secret of ensuring balance. Educated in the British Army schools, he flew in the first World War. Later returning to his paper models, designed and produced many millions of them; was acclaimed by the R.A.F. and others as a potent force in the areo-education of the Empire. He has always stuck to scale jobs.

Dick Gelvin . . . This fellow needs no introduction to the flyers in the Mid-States area. He has been Secretary-Treasurer of the Mid-States Association; also has been Mid-States Contest coordinator, Contest Board Member, and is a Leader Member and Contest Director. Dick ran the Speed Events at the 1949 Olathe Nats. He will long be remembered for what he claims to be one of the longest official R/C flights on record; after getting the Speed flights going smoothly, he sneaked over to the R/C site with a new and untried Rudder Bug. Dick hooked one of those typical Kansas thermals. Unmarried, he's a buyer of electrical equipment for Beech Aircraft. Spent 3 years as A.F. navigator and pilot. Holds Commercial Flying ticket.

Keith Storey . . . A model builder who has turned his hobby into his vocation, Keith now works for Duro-Matic as a Product Designer and Supervisor. A YMCA model building program launched him in our favorite hobby when he was only 8. Best known for his exploits in the field of controline speed, he held many records and could most always be found in the winner's column of contest results. Among his top wins were several firsts at the '47 and '48 Nationals and Internationals; he was a member of the West Team at the East-West Challenge Meet in '47. Having done so well in speed, Keith helped develop another idea—team racing. His Key and Quest team racers are still widely flown. A member of F.A.S.T. Unmarried so far, served two years with the Air Force during W.W.II.



Myrtle B. Robbers . . . Seldom do we see a report of model club activity on the West Coast that does not contain the names of "Mom" and "Pop" Robbers. Though this item is really supposed to be about Mom, the fame of these two flyers and organizers as a team has spread all over the country. Mom is now a dental assistant. Has raised a model building family of three sons. In fact, it was family interest in a common hobby that started her modeling in 1937. She has gained fame as a builder and flyer in her own right; was Woman Champ of the All Western Open in 1948, National Woman Champ at Olathe in 1948. She has held a National record in Class C outdoor rubber. She and Pop are now very busy with affairs of the Western Associated Modelers, and can always be found at meets.

Harold F. deBolt . . . No need to mention that this gent has won a few contest places. Harold owns and runs (for the few who haven't heard) his own model company in upstate New York. Has originated several new ideas in design, including "circle flight" and "weathervane stability" for controliners. Has always favored short-coupled, high-speed stunt models; his newest stunt design kink is "asymmetrical stability." A year-old convert to R/C flying, he has a kit ship, the "Live Wire," now in wide use. Has held AMA speed records in every class at one time or another, holds present Class D mark of 162.53 mph. Though always best known for his C/L exploits, was N.Y. State Free Flight Champ in 1940 and '41. One of the first users of dethermalizers—he fitted wing spoilers operated by timer. In Navy during war.

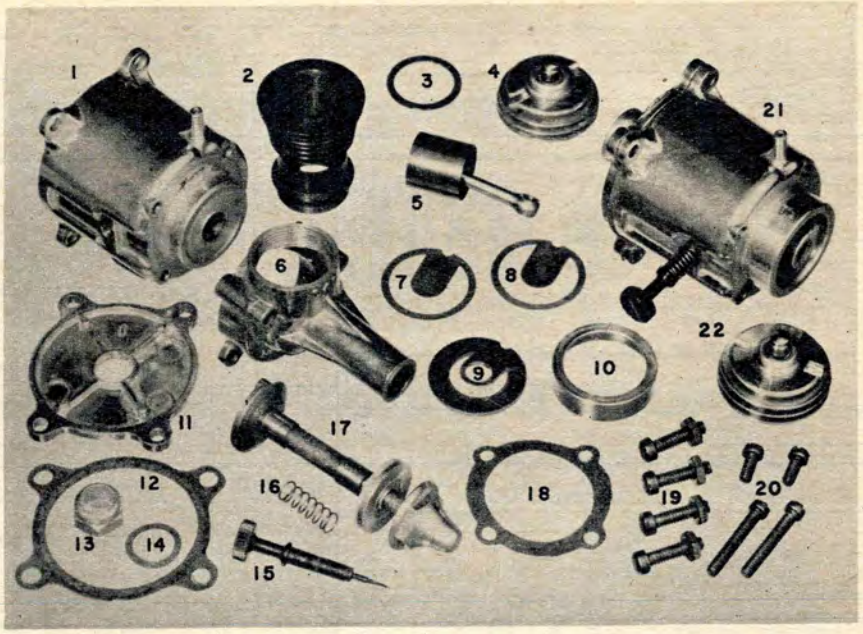
S. Calhoun Smith . . . Long-time contributor to A.T., Cal is famous for his beautiful controline scale models and team racers. An aviation illustrator by trade, his art work has appeared on A.T. covers many times. Commenced model building at age 12, following Lindbergh Atlantic flight. Spent four years in Air Force during last war, flew all A.F. types up through B-25. Has Commercial flying license with well over 1,000 hours, has done considerable full-scale glider flying. His garage now houses partly finished Continental racer; Cal is part owner, did plenty of design and construction work on project. Claims no modeling records, but was the winner of first Navy Carrier Event at Dallas in 1950. Though an Air Force man, he thoroughly enjoyed prize of a trip on Navy Carrier. Recently finished book on general model building, has plugged modeling on television. Married to very understanding wife, Ticky, has 5-year-old son, Skeeter. Has "Bonzo" U/C scale model in works for A.T.

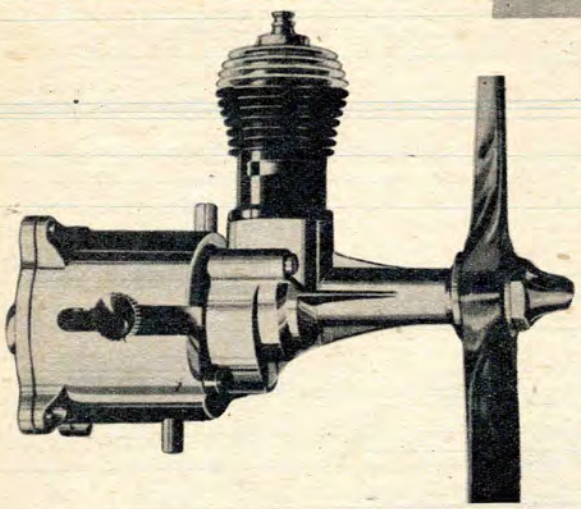
Frank B. Bushey . . . Another of those modelers who are outstanding in helping out the uninitiated, Frank has held many AMA offices including Treasurer, and last year was elected President. Frank can always be seen at the meets guiding a group of flyers through the contest routine, helping those with problems, starting balky motors. Has taught elementary school for 21 years, and you may be sure a lot of his pupils were inoculated with the modelplane virus! Started model building in 1940 with one of Carl Goldberg's Zippers. It flew, and that was just the beginning. He won the Connecticut F/F Gas Championship in 1947, but Frank is more interested in helping the other modelers than in gathering hardware. When elected AMA Treasurer, and knowing of the considerable criticism of AMA finances (some of it came from him), he journeyed to Washington at his own expense to learn the true story. Is married and has two daughters, Betty Ann (8) and Trudy (2).

MOTOR OF THE MONTH

SPACE BUG

Cox & Co. come up with reed type intake valve engine; the result is a powerful, high rpm Half-A mill





■ The name "Thimble Drome" has been known to model builders for many years through the small race cars manufactured by L. M. Cox Mfg. Co. of Santa Ana, California. Their new Half-A "Space Bug" engine has many revolutionary features including a reed type intake valve, carburetor in the center of the fuel tank and low friction design.

At first glance the needle valve sticking out of the fuel tank is most striking. Air enters a filter at the rear of the tank and passes through a venturi tube to the needle valve and picks up fuel. The resulting mixture passes to the back of the engine where it enters the crankcase through a reed type valve. This is made up of two flexible brass reeds, one .001" thick and the other .0035" thick, held against the end of the venturi tube. A back plate keeps them in place and limits the amount of bending so they will not crack.

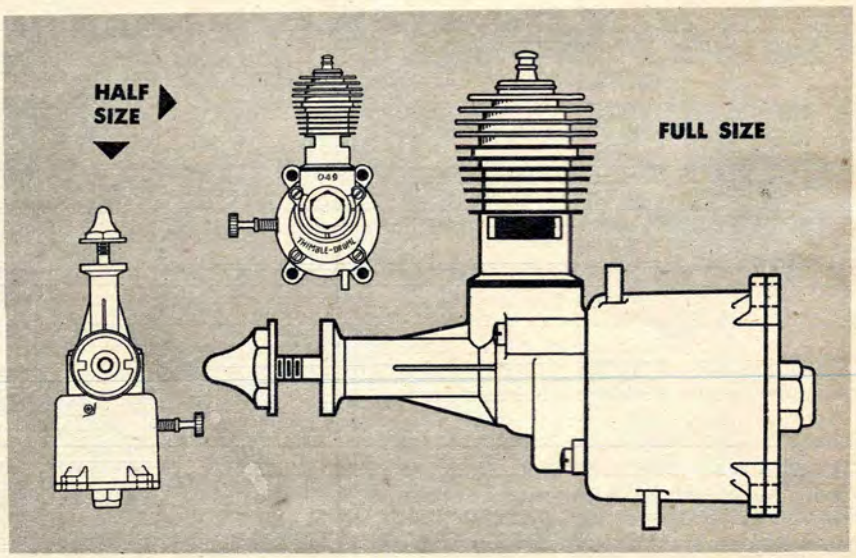
From the crank case the fuel mixture passes into the cylinder through the two milled bypass slots in the lower cylinder wall. The top of these ports are curved to smoothly deflect the air stream into the cylinder. Burned gases leave through two generous exhaust ports milled in the sides of the cylinder. The cylinder head and glow plug are made in one unit with a smooth dome-shaped inner surface for efficient fuel flow. A hardened and ground steel piston is used with a ball and socket type connecting rod. Friction and loss of power is reduced by using a small diameter hardened and ground crank shaft. Oil drag is also cut down by relieving the center of the shaft.

Good bearing material and precise fits are used to eliminate undue wear in spite of the small bearing area. High pressure aluminum die-castings are employed for the base and gas tank assembly. Radial motor mounts are provided at the rear of the tank; a hole must be drilled in the motor mounting surface so air can reach the carburetor.

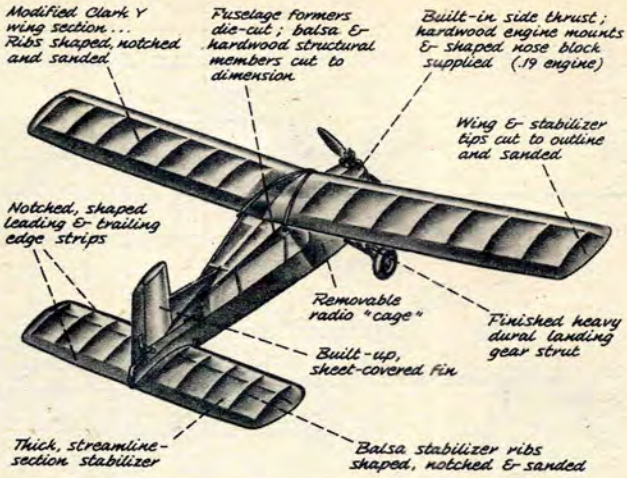
Outstanding high-speed performance has been obtained by designing for low friction and large port areas. The reed type intake value eliminates oil drag common to disc type valves or the large crank shaft rotary valve designs. A good finish is used on the crank shaft, piston, cylinder and other bearing surfaces.

Early in the engine test it was discovered that strong motor mounts must be used. The engine and propeller extend far ahead of the mounts causing extra strain and the engine delivers a terrific burst of power when it starts. Hard 3/16" plywood should be used. Initial speed was 14,000 rpm on the 6/3 propeller supplied with the engine and this increased to 15,200 rpm after four hours' running. Performance was good at the start but the break-in from that point was gradual, due to a good fit and smooth bearing surfaces in the engine. A good compression seal in the head and base produced easy starting.

The needle valve must be closed when filling the tank so fuel will not run into the carburetor and flood the base. The engine should be primed, with batteries connected, ready to flip before opening the needle valve. Throughout the test, performance (*Continued on page 73*)



Senior R/C'er


Modified Clark Y wing section... Ribs shaped, notched and sanded
Fuselage formers die-cut; balsa & hardwood structural members cut to dimension
Built-in side thrust; hardwood engine mounts & shaped nose block supplied (.19 engine)
Wing & stabilizer tips cut to outline and sanded
Notched, shaped leading & trailing edge strips
Removable radio "cage"
Finished heavy dural landing gear strut
Built-up, sheet-covered fin
Thick, streamline-section stabilizer
Balsa stabilizer ribs shaped, notched & sanded

■ This particular kit is something a bit unusual, for it is decidedly of an experimental nature. The Live Wire Senior itself is not experimental; it has been flying for well over a year, and has racked up an impressive list of contest wins. The makers, deBolt Model Engineering Co. (Williamsville, N. Y.) had some doubts that a kit of such size—and cost—would prove popular with the R/C fraternity. For this kit sells for $14.95, and is intended strictly for R/C purposes. Due to the great expense of preparing a kit of this sort, and the resultant comparatively high price, Dmeco decided to try it out on a limited production basis.

In appearance, the Senior looks like a dead ringer for the smaller Live Wire Trainer. It has the same sort of chunky appearance, the very low dihedral, and the "Cessna type" landing gear of dural sheet. The parts list packed in the kit looks something like an inventory sheet for a small model shop; the wood is of the highest grade, and furthermore, it is apparent that real care has been exercised in picking the wood for its intended use. Most of the wood is of rather a hard grade—this ship is meant for rugged use and a long life!

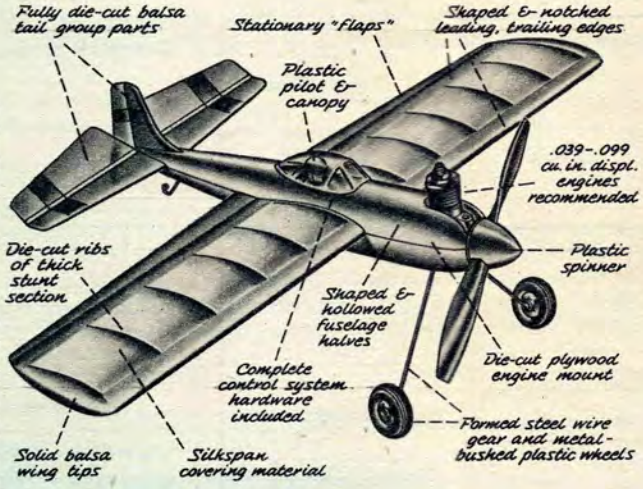
The fuselage is built up and covered almost entirely with balsa sheet; there is just a small portion on each side that requires cloth covering. The plane is intended for a .19 engine; the K&B .19 has been used with an 11/4 Tornado prop. The radio equipment is all fitted into a removable box, and there is lots of space—the box measures about 4" x 7" x 8" inside.

The wing is of rectangular shape, with the tips slightly tapered and with a small amount of washout. Both leading and trailing edges are sheeted. The stab is symmetrical, and shaped and notched edges are furnished for it. Ribs for wing and stab come completely finished; they are machine cut and entirely uniform.

The finished ship has a span of 65", area of 750 sq. in., and will weigh about 2½ lbs. without the radio apparatus. The design weight is 3¾ lbs., but the Senior has been flown with a total weight of 6 lbs. Engines from .19 to .23 are recommended, and flying speed is between 20 and 30 mph.

Smaller brother of the "Senior" is the standard Live Wire Trainer which has a wingspan of 48 inches, a wing area of 432 sq. in. and an all-up weight of 35 ozs. The smaller R/C job takes the .049 engines.

Prefab Zenith


Fully die-cut balsa tail group parts
Stationary "flaps"
Shaped & notched leading, trailing edges
Plastic pilot & canopy
.039-.099 cu. in. displ. engines recommended
Plastic spinner
Die-cut ribs of thick stunt section
Shaped & hollowed fuselage halves
Die-cut plywood engine mount
Complete control system hardware included
Formed steel wire gear and metal-bushed plastic wheels
Solid balsa wing tips
Silkspan covering material

■ Another new design for the small motor enthusiasts, the Zenith is a product of Enterprise Model Aircraft & Supply Co., Inc. (Mineola, N. Y.). Suited for engines from .035 up to .074, it works up into a sleek little mid-wing stunter. The kit sells for $2.50 and should make a fitting companion to such other popular Enterprise kit jobs as the "Sky Leader" and "Baby Era."

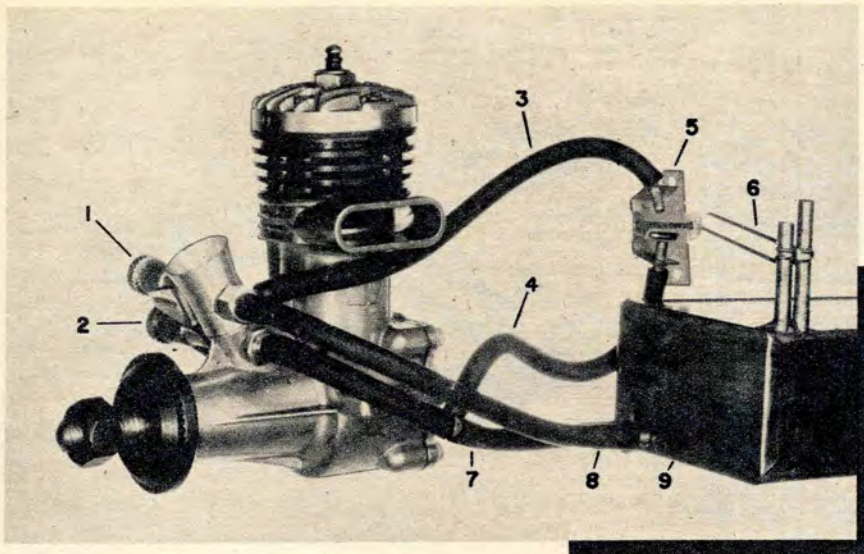
The purchaser will find this an exceptionally complete kit, for everything he needs is included except the liquids and power plant. Enterprise molds all the plastic parts in these kits, so it is no surprise to find a box of such parts included for Zenith. There are three of these—a heavy molded cockpit canopy that will not collapse, should the tyro flyer land the ship on its back, a pilot to go under the canopy, and a neat two piece prop spinner of 1¾" diameter.

The fuselage is composed of two shaped halves of balsa, identical except that one has a cockpit cutout and the other a slot for the landing gear. These halves are hollowed out, and have a slot cut for the wing to pass through. The die-cut ply firewall is punched for the landing gear binding. Something unusual in these days of such widespread use of woodscrews for engine mounting, this kit includes nuts and bolts for the purpose. The landing gear wire is formed, and there are long eyelets to be inserted in the rubber wheels; these insure smooth turning and long wear.

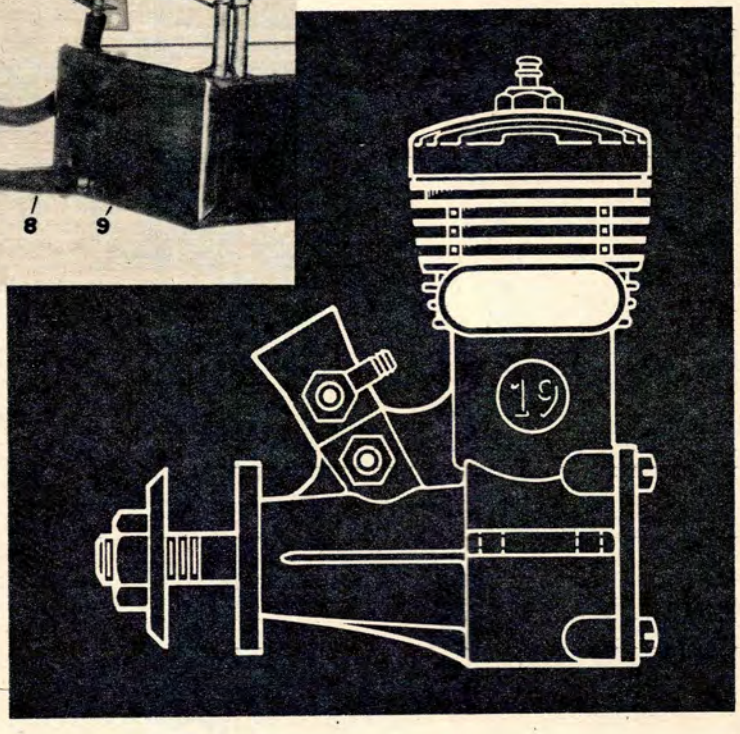
The parts for the control system are complete; you get an aluminum bellcrank, pushrod wire, metal control horn, and a bolt for the bellcrank. Half the wing ribs have cutouts for passage of the control wires; the entire control system is internal, making for a very neat appearance.

Wings are of built-up style. Leading and trailing edges are shaped and notched, and ribs are die-cut. Tips are to be cut from balsa blocks, and there are full-span sheet trailing edge pieces that give the wing a tapered appearance. Paper covering is furnished. The tail surfaces are all of die-cut balsa.

The 11" x 17" plan sheet features a large exploded view of the entire plane, plus a set of wing construction sketches, and other sketches of the engine installation. There is also a photo of the finished model. Colorful appearance of the model is enhanced by a sheet of three-color decals.



Equipment Used for Test: 1. Low-speed needle valve. 2. High-speed needle valve. 3. Low-speed air vent control tube. 4. High-speed air vent control tube. 5. Vent control valve. May be Bonner "Motor Control Unit." 6. Speed control lever. 7. High-speed fuel suction tube. 8. Low-speed fuel suction tube. 9. Fuel tank.



MOTOR OF THE MONTH

Two-Speed TORP

K&B Clan comes up with the answer to radio flyers' prayers—a glow plug engine with a double needle valve

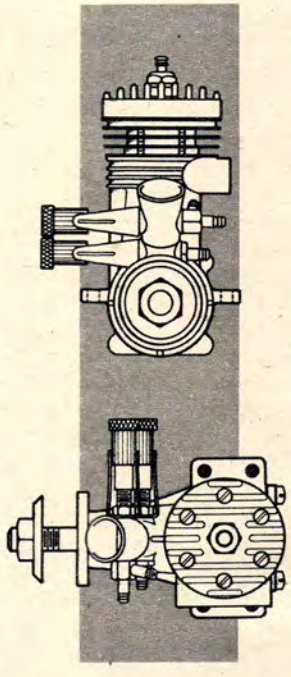
■ Since the introduction of glow plug engines, double ignition point two-speed systems have been losing popularity. Many varied attempts have been made to produce a satisfactory two-speed control for glow plug engines, but each has certain drawbacks. To solve this problem, K&B have put on the market a double needle valve .19 engine that will soon replace the old double ignition breaker system.

Bonner Specialties of California was involved in the development of this system for radio control models. Two needle valves are fitted on the engine and are controlled by air vents so that only one operates at a time. Opening one of the vents allows air to enter the fuel suction line and breaks the suction so that air rather than fuel reaches the needle valve. The Bonner Control Unit has two air vent tubes fitted so that one or the other is closed by a rubber valve controlled by a mechanism similar to a radio control escapement.

A complete hook-up is shown in the photograph. When the control lever (6) is down, air passes through tube (3) to the low speed needle valve (1) and cuts it out. At the same time the control valve (5) has tube (4) closed so fuel is feeding through suction line (7) to the high speed needle valve (2) and operating the engines at high speed. Shifting the control lever (6) upward cuts out the high speed needle valve (2) and causes the low speed needle valve (1) to function by closing tube (3). Shifting the control lever to center leaves both vents open and will cause the engine to stop in two or three seconds.

This system of speed control is very sensitive and requires only a slight amount of movement or power to operate. By using a soft live rubber for the valve and 1/16" O.D. brass tube with a narrow rim contacting the rubber, one-tenth of an ounce force acting through a distance of 1/32 inch will control the engine. Such a valve might be operated by a relay or connected directly to a radio control escapement. A simpler control hook-up can be made by using only the top vent tube (3) and a single valve at (5).

Great care must be taken to locate the units properly when installing. The fuel tank must have the top surface slightly lower than the needle valves so fuel will not flow to the engine when the vents are open. Also, the tank should be close to the engine. The control valve or vent will operate best above the needle (*Cont. on page 74*)



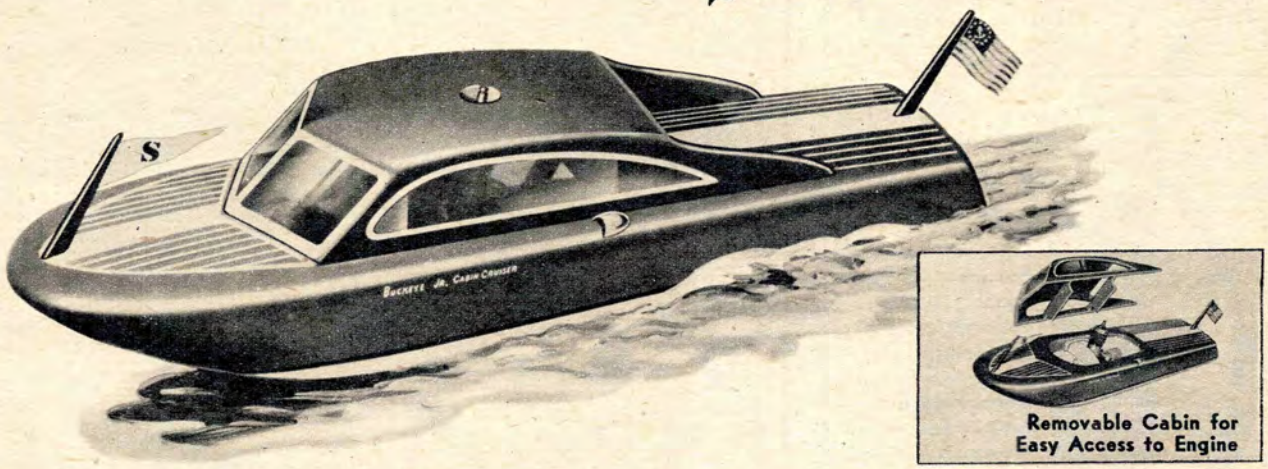
FRONT & TOP—HALF SIZE

SIDE VIEW—FULL SIZE

Stroke	**.620 in.**
Bore	**.624 in.**
Displacement	**.199 cu. in.**

Scientific announces the great ***new***

Buckeye Jr. Cabin Cruiser



Removable Cabin for Easy Access to Engine

A great advance in **value** *at no advance in* **price**

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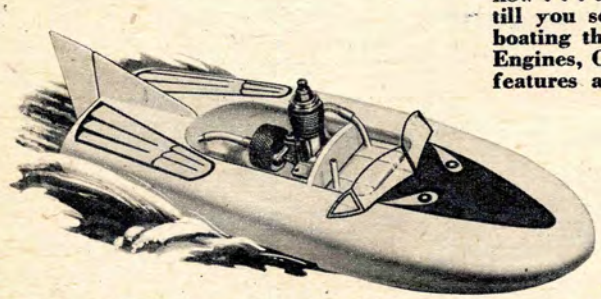

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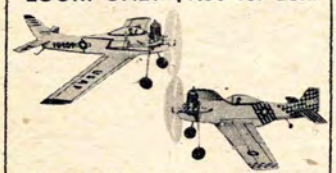
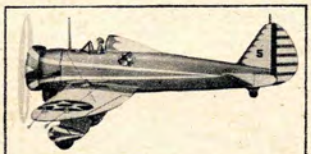


F-86 SABRE F-51 MUSTANG

Realistic Profile Models—"½A" U-Control



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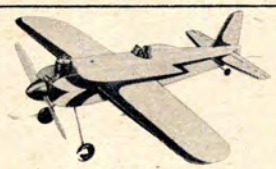

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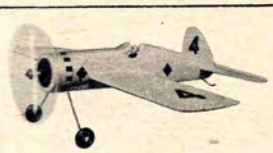

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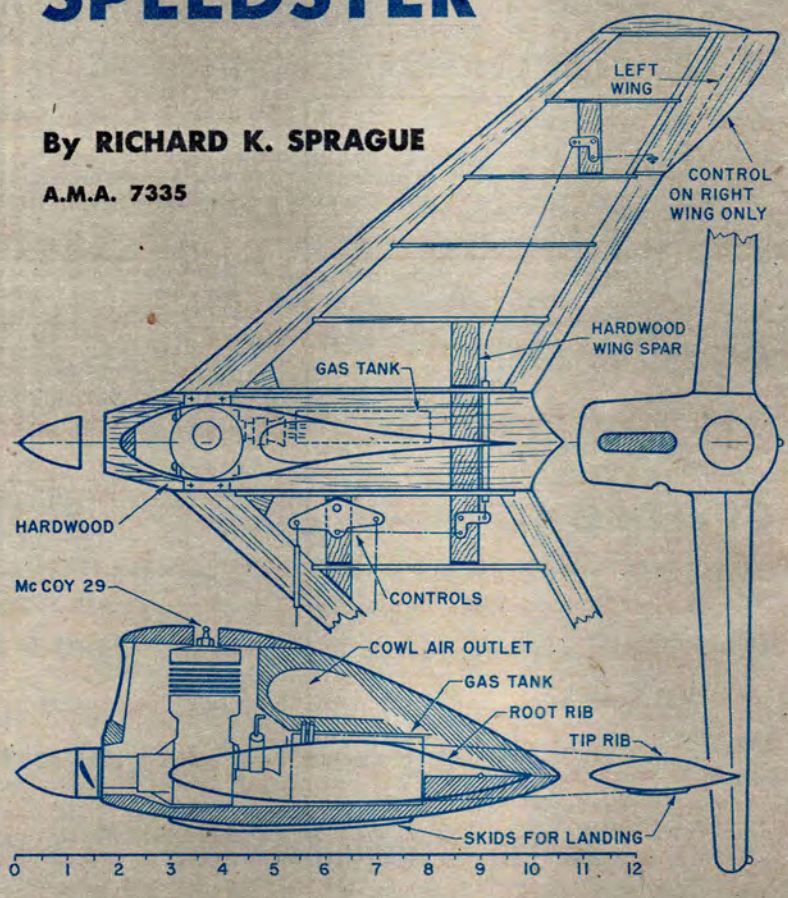

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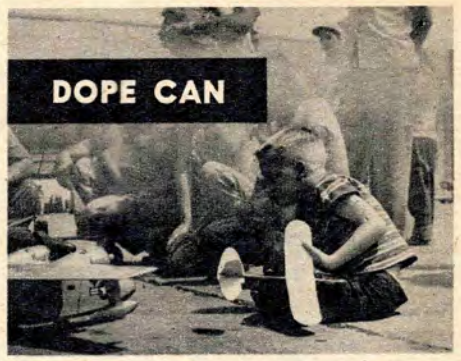

"When am I gonna be able to build one like that?" wonders the youthful glider enthusiast. Dick Everett of Western Round-up fame made this fine shot of SA-16A at National Contest.

Mechanical pigeons in first over-water contest

■ Aviation legend in the Orient has it that the ancient Chinese trained geese to fly cross-country to and from assigned destinations and thereby established the world's first air mail service. Carrier pigeons are the modern heirs to this legend, and carrier pigeons are widely used in the Orient today. Japanese newspapers employ pigeons to bring in on-the-spot reports from outlying events.

Japan's Press Mainichi recently reestablished its aviation department. Experts in this section figure the time had come to modernize carrier pigeons as a part of the mechanical age. They sought the cooperation of Pan American World Airways, sponsors of the PAA-Loan competition. And so a new idea was born: train Pan-American load-carrying model airplanes to fly cross-country to an assigned destination and make model history!

Cluff Dilley who's been around here before sent this photo of MiG-15 built from solid kit. The Baby Brownie photo makes it look like the real thing from behind that certain curtain.

Enter the mechanical carrier pigeon . . .

To test the feasibility of this proposal, Press Mainichi and Pan Am arranged a unique model airplane contest with tempting prizes—Yen 50,000 ($140) and a PAA-Bulova wristwatch to the winner. The competing models were assigned a simple but tough ask. They were to fly carrying two ounces of "payload" messages from tiny Hatsushima Island over 5½ miles of open water and alight in the vicinity of Ito village on the main Japanese Island of Honshu. Aside from this task, the rules were simple. The models could be of any design, size and power, so long as they had a total weight of less than 7 lbs. Flyers could hand-launch their entries and engines could run as long as the fuel lasted.

Japanese weather experts, dusting off their wartime free balloon raid techniques, predicted a helpful breeze from Hatsushima to Ito on a particular Monday. And they were right. At 11:15 in the morning 37 contestants stood poised for the launching while a dozen spotter-rescue boats anchored along the course and 120 judges with field glasses were dispersed along 4½ miles of coast line bordering the village of Ito. Within five minutes 21 of the models were in the air; the remaining 16 "pigeons" balked at starting across the miles of cold and turbulent water.

None of the contestants risked trying a

Cub Super Cruiser plows into snow bank! But no headlines ensued on accounta it was a 40 in. model by Emil Maslak of Bradford, Ont. $5 payment for photo will replace kit, anyway.

bee-line dash for the mainland; all models were adjusted to climb in circles until the engine quit and then spiral down in a dead stick glide, counting on the wind to carry them across the watery 5½ miles. Most of the models were standard free flight gassies to which extra fuel tanks were added for the long flight. Some carried float gear "just in case," but the majority had no landing gear, *à la* the Kamakazi.

Of the 21 starters, three disappeared completely with no subsequent reports as to their fate. Most of the mechanical pigeons got tired and settled down onto the water; one made a perfect float landing within 100 feet of the mainland shore line goal. Shore observers saw one model pass overhead toward the mainland mountains so high that it could not be identified through field glasses. Only one pigeon did as instructed and thus flew off with all the prizes.

Mitsuo Kishi, 25-year-old maker of wooden tubs and (*Continued on page* 75)

Diesel-powered flying saucer from England indicates what can be done if you have a big enough compass. From expression on face of onlooker we'd say the effort was worth it.

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Actual photograph of model, built from Kit.

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Taming the Twins

(*Continued from page* 46)

the results of all this research revealed that regardless of the system you use for a twin engine free flight model, if you want the model to survive, then you've just got to accept one simple fact—*the model must be able to fly satisfactorily on only one engine.* Then it doesn't matter if your fuel system has a failure.

Let's consider all forces involved.

First, take a look at the principal thrust and drag forces acting on a conventional twin-engine job when both engines are running at the same speed. Without going into all of the complexities which are involved, you can see that the two equal thrust forces are pulling the model forward, overcoming the drag of the model, which acts down the centerline of the fuselage. (Fig. 1.)

Now let's see what happens when one engine quits (Fig. 2). The drag continues to pull back along the centerline of the model, but the thrust of the engine which is still running is way off to the one side; this creates what is called a "couple," with a strong turning force. The drag holds the model back, while the thrust of the live engine pulls that wing forward, thus turning the model sharply towards the dead engine.

The turning force is so strong that it puts the model into a violent spiral dive, even though a comparatively large vertical tail surface is used. Obviously this force setup is no good for what we want —a twin-engine job that will fly well with one or both engines running.

It doesn't take any genius to see a quick solution. Lots of problems have been solved with offset thrust, and this is just one more. Solution? Give the left engine left thrust, and the right engine right trust. Now take a look at the forces; with both engines running, one balances out the other insofar as left and right thrust offset are concerned (Fig. 3) and there are no problems.

Assume one engine quits, and what do you have? Again the thrust of the one engine creates a turning couple—but since the engine points outward, it tends to pull that way, thus lessening the turning moment between the thrust and drag. This factor, in itself, is not enough, however, unless you really have that engine pointed almost straight out. But there is now another point to consider; the thrust offset sends the prop blast back against the vertical tail surface, pushing it to one side, and, as you can see from the diagram, this also counteracts the turning couple between the thrust and drag (Fig. 4).

Simple enough, so far. For single-engine performance, point your engines outward, and have a big enough vertical fin and rudder to make the one engine prop blast really effective in helping to overcome the turning moment. But wait a minute—there's one last little joker, and that's that big fin. With both engines going strong, it could very easily create spiral instability, so don't forget that you must have quite a bit of lateral area ahead of the center of lift—otherwise you have a twin engine job that will fly pretty well on one engine, but spiral in when both engines are going!

Well, that's about all there is to it. Probably the slipstick soothsayers could sit down and figure out just how much thrust offset, nose area and fin area would be required. However, the simplest way I could think of to test out the idea was to build a model which could

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Actual photograph of model, built from Kit.

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Actual photograph of model built from Kit.

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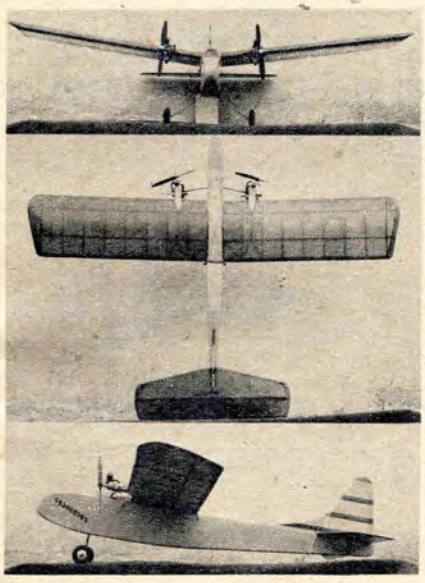
be altered to suit the needs as they arose.

The photo of the test model shows the general layout. The wing and cabin are attached to the body with rubber bands, and can slide forward and backward. The engine mounts are simple and permit rapid thrust line changes. Originally I started with a smaller fin and added sheet balsa; when I finally achieved what



I wanted, I built another fin which was the right size.

Note the long landing gear; it saved a lot of repair work during the test stages. Also, don't overlook the long range tanks. It's very frustrating to get one engine going, then have it run out of gas just as you manage to get the other one going. And don't think you won't have that trouble, no matter how good your engines are, because, unless you're superhumanly calm, after you get that one engine going, you'll try to rush the second one. This tendency, combined with the fact that you have the one engine going and can't hear the second engine too well, makes it hard to tell whether you've flooded it or starved it, and this only adds to the confusion.

I never have gotten around to trying a single cutoff which shuts off the fuel to both engines simultaneously. Actually, the test model finally flew so well on either one or both engines that I didn't figure it was worth the effort. However, for those who might want to try it, you could use an Elmic dethermalizer timer (you know, with the arm on it) which would actuate a bellcrank, which, in turn, would pull a wire hook to pinch off the fuel line to each engine.

Of course, for the guy who likes it complicated, there are lots of ideas—. pressure tank for a single fuel system, engines mounted on movable nacelles which would actuate the rudder when one engine quit. But if you want a simple, reliable twin engine job, just run a few experiments with the force setup given here. Naturally, for the minimum amount of thrust offset, you want the engines as close together as possible. Thus, the Catalina PBY-5A arrangement is good.

And for the guy who wants a twin-engine job and figures that just getting both engines running will be enough trouble—okay, go ahead, make yourself a tandem push-puller. That's not really taming the twins, though—you're just "torqueing" them out of it. Hm-m-m.

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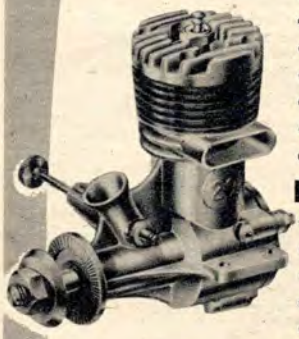

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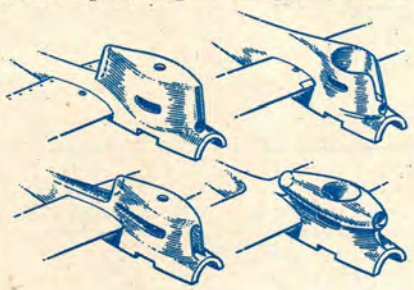
Speed Scoop

By H. A. THOMAS

■ When the mid-afternoon ocean wind came up each day at the Los Alamitos '52 Nationals, virtually all events halted activities—some for the remainder of the day, others to resume late in the afternoon. An exception was the control-line speed event which rambled throughout every day of scheduled flying and surprised many with the sustaining interest and the high-caliber flying of its hustling contestants.

Now well stabilized by rules which seem acceptable to most enthusiasts and which also promote safety among contestants and spectators, speed flying in the U. S. appears destined to continue to attract its full share of attention and actually seems more stable, year in and year out, than many other model categories.

Looking back, each season is remembered for outstanding highlights: Newburger's early successes with first models bearing current configuration; Lew Mahieu's one-time clean sweep of all A.M.A. speed records simultaneously; Harold deBolt's "Speed Wagons" competing nip and



CURRENT STYLES IN COWLING DESIGN

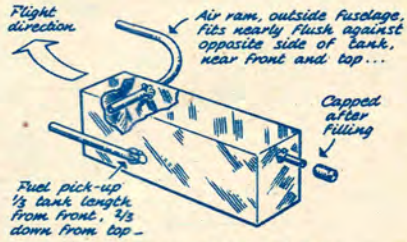
tuck against the best from the West Coast; Keith Storey's precise, workmanlike performances; Tony Grish's mastery of Class B; perfect cooperation among "teams" such as Huth-Matthews, Manley-Hudson, Hall-Massey; Tommy Baker's F.A.I. jet record flights; Dick Modeler's successes in junior age group—these being matched by the top performances of 1952: Sgt. George Mueller's sensational Torp .19-powered "Winder" which set an amazing Class A record, won the AAF Nats, won the Los Alamitos Nats, then copped two world F.A.I. records; and Mark Brown's three firsts and one second place at Los Alamitos in senior age group!

Few of us will deny experiencing a thrill when we hear an engine hit its peak, see the models "get on the step" for a series of blistering laps. Add some smoke, the smell of castor oil and methanol, the frenzied efforts of the contestants themselves—this is speed modeling, a colorful, ruggedly individualistic part of model aviation.

Speeds continue to slowly increase, indicating a constant refinement in model design, flying techniques and engine performance. Our heavy flight lines, required for safety, hold back models which would otherwise be reaching truly sensational speeds. When Ed Happich fired up his Class D speedster for a quick test, his competitors were flabbergasted to clock readings of 165 mph. But was Ed chagrined to find he had mistakenly used his Class B lines (ten feet shorter and .004 smaller than required)! Each increase of one-thousandth inch line diameter likely penalizes us three to five mph.

Styles changed in '52 speed-wise. Now we have rudders again and users claim more stability, less objectionable yaw even with straight settings. Ships with lathe-turned fuselages usually have little area at the rear and since helmet cowls cannot go beneath a certain minimum side area considering good streamlining, we have come up with models having little weathercock stability.

Overemphasis on the relationship between C.G. and line guide location has brought on a general disregard for the importance of the fin. It has been a mis-

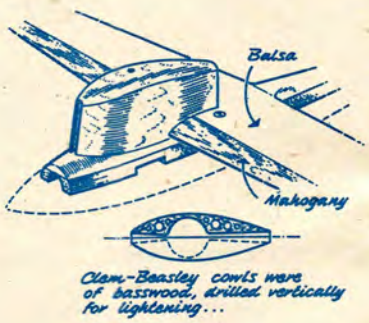

Flight direction
Air ram, outside fuselage, fits nearly flush against opposite side of tank, near front and top...
Capped after filling
Fuel pick-up 1/3 tank length from front, 2/3 down from top

HERM SHIMAN'S "PRESSURE" TANK

take to believe that so long as the model has no inward-turning tendencies there is no need for fin area. To the contrary, the fin can reduce excess outward pull and so increase speed. Some designs having fuselages which flatten toward the rear (such as Hell Razors and Little Rockets) have adequate fin effect as a consequence and need no supplemental area atop the stabilizer.

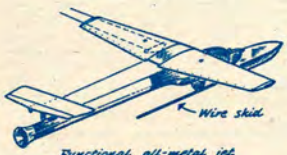
The occasional model which is carefully "bent" or rather built with an inward-curved fuselage to suit the circular flight path more perfectly is virtually matched, in a much more practical way, by the conventional ship with an inward-turned rudder.

A few seasons back, a cast aluminum or magnesium bottom was a rare item, available at only a couple of sources in the country. But a new crop of proficient young pattern-makers has changed the picture recently. We observed a number of original cast bottoms at the '52 Nats: the "half-pans" made by Jack Friedland and used by Mueller and others; Sgt. Sugdin cast his own as did the Clem-Beasley team. Patterns are carved of soft pine, carefully hollowed to precise thickness allowing an extra margin to later be



ground or filed away. There are some knacks in shaping the pattern to aid its easy withdrawal from the casting sand. But once the form is finished and checked for accuracy most foundries can cast the metal bottoms using the desired type of aluminum alloy. Scrap metal, obtained from aircraft plants, is a suitable and inexpensive material.

The "half-pan" system of assembly which was used so successfully by Jim Clem and Maurice Stanglin in the "Whammy" models has some particular advantages when the bottom is metal. While the control system is not always accessible, the wooden rear section of the model is doubtless lighter than when the full-length metal bottom is employed and a more favorable balancing condition results. The C.G. is thus in more forward position due to lighter rear section and a forward wing location and wing guide location makes for improved all-around handling in flight.



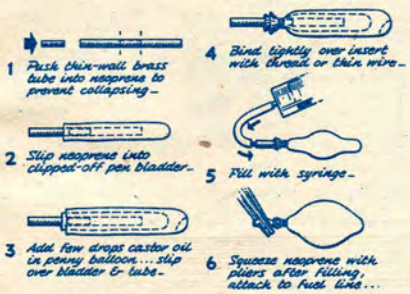
Functional, all-metal jet had components welded or bolted directly to engine...

Mueller's "Winder" design provided direct blast into engine venturi...

Sharing equal popularity with the revival of the rudder or vertical fin in '52 speed models was the balloon tank. Here we gathered several conflicting opinions. For instance, Jim McElroy favors the balloon tank for smallest class models, thinks it not best suited for the big jobs. Dallas' speed crew of Clam, Beasley and Swenson feel the balloon tank is good medicine in all classes. All Mueller's successes in Class A were with balloon tanks; Herm Shiman copped Class D with a metal "pressure" tank.

"Dzus Buttons", quick attachment aircraft fittings, used to hold fuselage halves together...

While the pen bladder is the actual container for the fuel and can hold sufficient quantity for the largest models, an outer supplementary penny balloon is used in standard practice to eliminate chafing of the bladder within the fuselage. Castor oil lubricant between the bladder and the outer balloon eliminates friction. The knack of filling the balloon with a heavy-duty syringe is a quick operation for those with experience. After filling, small-nose pliers hold the neoprene fuel line closed until it is slipped over the


1 Push thin-wall brass tube into neoprene to prevent collapsing -
2 Slip neoprene into clipped-off pen bladder -
3 Add few drops castor oil in penny balloon... slip over bladder & tube -
4 Bind tightly over insert with thread or thin wire -
5 Fill with syringe -
6 Squeeze neoprene with pliers after filling, attack to fuel line...

MAKING AND FILLING THE BALLOON TANK

tube to the needlevalve (the valve must seat perfectly to close off the fuel pressure until the moment of starting).

There are four principal types of fuel supply systems: 1) the ordinary metal tank with filler and vent either inside or outside the (*Continued on page* 62)

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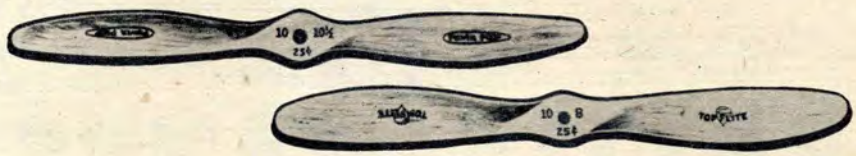

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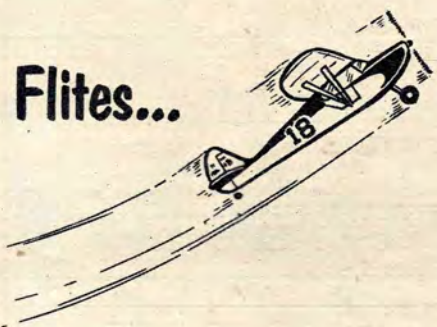

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Manny Andrade gets his twin return-gear Wakefield off. The transparent covering is condenser paper which the Northern California flyer now considers too fragile for contest use.

U. S. Teams Possible In International Contests?

■ A lot of fellows here on the West Coast are doing some very serious thinking about the various international contests coming up this year. With England in possession of the FNA cup for team Wakefields and the Free Flight Power trophy, Sweden, the Wakefield, Yugoslavia the Nordic A/2 contest, the U-control site is yet to be named. Some fellows want to have an American Nordic elimination, others a free flight; the Wakefield is a certainty but not one word as yet about U-control.

It was indicated at the power championships in Switzerland that it is quite possible for a proxy flown ship to win when Silvia Lanfranchi flew an English lad's ships to first place, so it is quite possible that if we do send ships to these contests to be proxy flown, that we could win. In a lot of cases the proxy flyer for some reason or another manages to get more out of a ship than the builder.

Duane Eisenbeiss sets Torp-powered Hogan on its tail while making thrust adjustments. According to Western Roundup's foreman Dick Everett, Duane is a "real super" junior flyer.

One item which must be considered when having these eliminations for proxy flying is the mailing regulations. The models must break down into small sections to fit in the necessary box. The box cannot be over 42 inches long and length plus girth must not exceed 72 inches, which means that the wings of all ships must be in at least two sections. Taking

this into consideration, it should be a requirement of any U.S. eliminations that the models to compete must demonstrate their capabilities of fitting into a box of these limited dimensions. It can be expected that the entry for these contests the first year will be small and that a lot of fellows will gripe about these restrictions, but they are a must.

Another factor which we should do a lot of thinking about is whether this should be a one-shot sudden-death eliminations or a series with the highest averages being our representatives. With power and gliders it will not mean too much that the weather is cold, since they

Paul Gilliam hard at work repairing Del Swartz's flying wing which proved to be overpowered with Wasp. The "stinger" was used to change trim. Quick, Paul, the masking tape.

will not be affected as much as the Wakefield models are. One source of trouble in Wakefield eliminations is that our very best models do not always get over, due to some lucky flights some contestants make, nosing out better models by a few seconds.

We very sincerely believe that we will not win any of these coveted cups sym-

F. L. Swansey demonstrates what we mean above. One of the favorite West Coast on-the-spot repair tricks is to hold the pieces together with masking tape. Torp .29 Hogan was 2nd.

bolic of a World's Championship until a better representative set of models are chosen. It is true that the final counting is a three-flight, one-day affair, and we do go through a series of eliminations, and weather conditions do vary. Due to the long distances we have to travel another factor enters into the picture, but we could have three flights on Saturday and three on Sunday morning with the highest averages of *six* flights being the winner. This will bring about more consistent ships.

The rules do (*Continued on page* 63)

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Speed Scoop

(*Continued from page* 59)

fuselage, fuel being drawn by engine suction and aided by centrifugal force pressure to the carburetor; 2) so-called "pressure" tank set-up using external air ram and sometimes a separate pressure compartment within the tank (Grish); 3) the true pressure tank having a line from the engine through which crankcase compression is fed into the sealed tank, forcing fuel evenly to the carburetor; and 4) the "balloon" tank in which the elastic pressure of the container forces the fuel at relatively even pressure to the engine.

A great many impressive, long-peak engine runs we have seen attest to the efficiency of the balloon tank. Its fool-proof simplicity and light weight are chief merits. Metal tanks often behave differently, even when built to identical specifications and the controversial factors such as tank location, dimensions, shape and the size, type and location of vents and fuel pick-up tubes keep most of us in a state of bewilderment. The interrelationship of these factors makes for real confusion when the engine does not perform to suit. Knowing the balloon tank can and does produce record flights, it would seem wise for more of us to adopt it and thus eliminate possibly the trickiest aspect of speed flying—the fuel system.

Nothing new was observed in the way of propellers. Nor did we see the occasional one-blader which heretofore would turn up at past National meets. Mueller's propeller was a stock Tornado Plasticote prop, used just as it came out of the box, little mold marks and all.

Roughly 50 percent of the wings were metal. There is a following after the style of Hall-Massey's neatly built-up wooden wings; a few solid pine and basswood wings; others of solid balsa with reinforcement at the center (Clem's capable models had balsa wings with inset mahogany leading edges—about 20 percent chord). Advocates of metal wings dote on their lightness and, once the methods of fitting, bending and riveting are mastered, they are doubtless quicker to build considering the finishing chore which is necessary with wooden wings.

Sgt. Mueller confided that the important leading edge bend of his metal wings is done on a sheet metalworker's brake. The thin, metal envelope, screwed or bolted to a metal or wooden spar, can actually be removed on the field in many cases and it is possible to replace a damaged wing panel with a spare one in an emergency.

Airfoil sections in the metal wings often are arrived at none too scientifically. The shape which "looks right" generally suits and the nature of the trailing edge riveting results in somewhat of a reflex curvature in both upper and lower surfaces toward the trailing edge. Lew Mahieu's sleek, sweptback metal wings had rivets at the tips and inboard ends only, the main trailing edge seam being glued or cemented with a special adhesive requiring use of heat to bond the surfaces together. Most metal wings are of .012 to .014 gauge ST aluminum.

The cowl offers the chief means of getting an individual's own distinctive design touch in his model. Something like 20 percent have exposed cylinder head fins, the others being variations of the standard helmet "pressure" cowl. There is more general use of internal baffling, however, with cooling air diverted upward toward the cylinder head and a separate lower air passage directed downward toward the venturi. Side ports and scoops for "cool" air for the carburetor are frequently seen.

Engine manufacturers would cringe at some of the "modifications" dealt their products in the hands of some of the speed demons. Many of these operations produce a mysterious drop in power and rpm, but others done by capable shrewd experts have paid dividends. Mueller's engine employed another make needle valve and seat, Shiman's engine topped its class with an old Hornet piston and rod, Mahieu's McCoy .49 sported an Atwood piston and a single ring, Jim Clem and Sam Beasley clocked over 128 mph officially with a Class A engine more than half home-built, and their winning Class C engine was "stock" *except* for a ball-bearing rotor, balanced crankshaft, chrome sleeve, two extra intake ports, welded crankcase casting for enlarged porting, lightweight piston, turned-down head, homemade front plate, modified extension shaft, homemade venturi and needle valve, hand-fitted rings and cutback exhaust; this engine clipped off 135.13 mph on its first flight.

Before we leave the impression that engine tampering is necessary in order to win, let us mention that the great majority of winning engines were stock ones. The desire to "work over" an engine is an inherent whim of most speed devotees and the gab sessions and inspections of one another's revamped engine is surely as enjoyable to the competitors as the flying itself.

Model finishes are predominantly the fuel-proof STA and Aero Gloss and the hot fuel-resistant synthetic enamels. Though rumors were rife about "new" ingredients

Flying Tigers' pilot Bill Korth (of K&O Models) with his Dyna-Jet powered F-90 which he'll fly at 5th Annual Calif. Hobby Show (Shrine Convention Hall, L.A., March 20). Spans 38 in., 5 lb.

in some fuels, the standard methanol, castor and nitro methane mix predominates. One winning model used a 43 percent nitromethane content.

Designs in speed have long since departed from any superficial resemblance to real aircraft just as, in fact, the real craft themselves have taken on new functional configurations. The jet models, never very sleek in appearance and with the majority having external engine mounting because of heat problems, have taken on even sterner lines. But speed is the goal and functional design is a step in the right direction. One jet used the engine itself as fuselage with wing, tail, tank and skid being bracketed directly to it. Nearly all jets skid off the ground without need of a dolly, and there is considerable successful hand-launching seen nowadays in the piston engine speed models.

That proficient speed model designers see alike was graphically demonstrated at the '52 Nationals. Tommy Baker, stationed in N. Africa, had built an original Torpedo-powered model there while Sgt. Mueller was developing his "Winder" in Arizona. At the meet, these ships were found to be almost identical in size, shape and structure and they placed first and second in competition, being separated by only a small fraction in speed.

Western

(*Continued from page* 61)

not vary too much from our own, only a slightly heavier loading and a different class for the engines. The engines allowed in the World Power Championship allow up to 2.5 c.c. or slightly more than .15 cu. in. which the Cub .14 and numerous smaller engines fit into. Loading is 200 grams per c.c. or roughly 115 ounces per cubic inch. Wing loading is 12 grams per square decimeter or about 4 ounces per square foot which includes both wing and tail areas, projected of course.

To build an .09 model this means that minimum weight can be almost 11 ounces. Wing and tail area for this will be about 400 square inches or a 280 square inch wing and 120 square inch tail if one holds to the usual 40 to 45% tail. To make a good ship of this size undercamber will be needed, since maximum flight time is five minutes and we will want to get as close as possible to each flight. The other sizes can be worked out accordingly. Half-A's will probably be very popular, so we will include it. Weight of a Half-A of .049 will be 5.7 ounces. Wing and tail area 207 square inches, which means a 150 square inch wing and a 57 square inch tail.

This in comparison to most of our ships is small and if controlled will mean a screaming climb almost out of sight. It might be good—we feel that a slightly larger ship will be better—but if you add only 80 square inches you have to go up to 8 ounces of weight, which brings the ship up to payload standards which then is not too good for consistency of any real high time. Try it out, though. This provides some school for thought: an entirely new set of rules which might put us at a slight disadvantage for a while.

The Nordic rules are much simpler. They have been published in this column before but since we continue to get questions about them all the time, here it is again. Total wing and tail area must be between 490 and 526 square inches. Cross section must be at least total area divided by 100, minimum weight 14½ ounces. You can let your imagination go hog wild but remember, you use 328 feet of towline so stability under tow must be excellent in order to use all of the line and get the ship overhead. Most fellows use tow rudders coupled to the tow hook but it is not essential; a long fuselage will do the same thing with offset tow hooks.

Since this year's Nats will be on the East Coast, it is quite a distance for the fellows to travel. In order to corral a larger representative group this reporter will try to coordinate rides to this event. If you fellows will write me in care of Air Trails, every effort will be made to make it easier on all concerned. It is advised that all who

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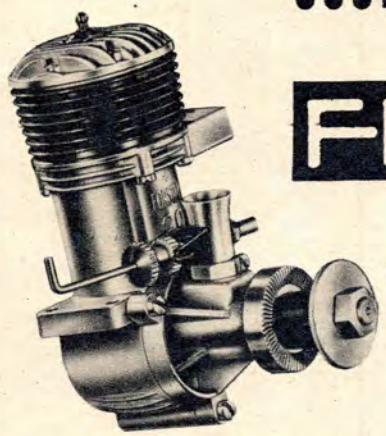

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You're in for the thrill of your life when you slide into the saddle of this power-packed beauty. There's an improved motor that adds real get up and go, smoother performance. There are sleek, racy lines and attractive colors that make this the most exciting motorcycle on the road. So, see the 165 at your dealer's today . . . and bring a buddy along. Send 25 cents for illustrated literature and a copy of ENTHUSIAST Magazine . . . it's filled with action pictures and stories. Harley-Davidson Motor Co., Dept. AT-5, Milwauke 1, Wisconsin.

Harley-Davidson

WITH Tele-Glide® FORK — MODEL 165

Model Rules for International F.A.I.-Recognized Competitions

Control line: All classes—minimum wing loading of 2.63 oz. per 100 sq. inches of wing and tail area, maximum wing loading of 11.377 oz. per 100 sq. inches of combined area, cross section not less than total area divided by 80, models must take off, dollies are permitted. *Class I* displacement tops is .1525 cu. in., minimum line length is 37 ft., 3.625 inches, flight is 14 laps, maximum model weight with fuel not to exceed 10.10 lbs. *Class II* displacement tops is .3051 cu. in., minimum line length is 43 ft., 5.44 inches, flight is 12 laps, maximum model weight with fuel not to exceed 10.10 lbs. *Class III* displacement tops is .6102 cu. inches, minimum line length is 52 ft., 1.56 inches, flight is 10 laps, maximum model weight with fuel not to exceed 10.10 lbs. *Reaction Class* restricts maximum engine weight to 500 grams, minimum line length is 52 ft., 1.56 inches, 10 laps to the flight and a maximum weight limit of 35.275 pounds with fuel.
Free Flight: Top displacement of .1525 cu. in., power loading requirement of 115.65 oz., wing loading including wing and tail area of at least 2.65 oz. per 100 sq. inches, minimum cross section of the total area divided by 100, unassisted take-off from three points.
Nordic A/2 Gliders: Combined wing and tail area between 490 and 526 sq. inches, cross section not less than total area divided by 100, minimum weight of 14.5 oz., and towline of 328 feet.
Wakefield: Combined wing and tail area between 263.5 and 294.5 sq. in., minimum cross section of 10.075 sq. in., minimum weight of 8.112 oz., rubber power, completely unassisted launch.

Radio Control NOTES from Tornado

VALUABLE TIPS

For the beginner making his first attempt at Radio Control flying and those not too familiar with engine and prop combinations.

Using any 48 to 54 inch span—wing loading up to 16 oz. per sq. ft.

ENGINES: OK CUB .099, on this engine it is necessary to reduce the venturi opening by 50 per cent. This will allow better fuel adjustment for hand launching and violent maneuvers. Set needle on rich side of peak so that in climb engine is fully at peak RPM. ARDEN .099 works well as is.

Right thrust your engine 2° to 3°—this has been found ideal.

PROPS

FIRST TEST FLIGHT and LOW ALTITUDE FLYING—Use TORNADO R.C. 10 in. dia., 2 in. pitch. This gives a flying speed of 14 mph, 100 ft. altitude gain per min.
MANEUVERS and MILD STUNTS—Use TORNADO PLASTICOTE 9 in. dia., 3 in. pitch. This will give a speed of 18 mph, altitude gain 350 ft. per min.
HIGH ALTITUDE and VIOLENT MANEUVERS—Use TORNADO PLASTICOTE 9 in. dia, 4 in. pitch . . . for speed of 20 mph, altitude gain 350 ft. per min.
All speeds and altitude gains are approximate, depending upon engine condition, fuel, wing loading. The use of 1 oz. Castor Oil per pint of packaged fuels is advised to offset extra engine load of large diameter props. Use HOT Glo Plugs.
R. C. PROPS 10 in. dia, 2-3-4 in. pitch, 0.35c ea.
Plasticote Props 9 in. dia, 3-4-5-6-7 in. pitch 0.25c ea.

TORNADO PROPS ARE ALWAYS AVAILABLE AT YOUR DEALER.

GRISH BROTHERS • ST. JOHN 1, INDIANA

want rides box up all except perhaps the last-minute job and ship them ahead of time, since cars crowd up easily. You guys who will drive your car will find it much less effort if there is someone along who will help drive. You who need a ride state age and if you possess a driver's license. It might be possible to pick up fellows all along the way so do not hesitate, no matter where you live. What say?

The San Francisco Vultures, primarily a free flight club, held a Half-A speed contest to stimulate club interest. A high school stadium proved very handy and close to all. The guys showed up with all types of models. Jack Ritner had an asymmetrical "delta" with a tail boom and also a "half delta." Bill Gunther had a "flying saucer." It seems both models were real good flyers; one minor point in design kept them out of the winners' circle—too small tanks. Jack had real tough luck when, on what was the fastest run of the day, his engine quit after 7½ laps. How 'bout that!

Conventional speed jobs dominated the top places. John Tatone, working hard to live up to that marvelous "Tipsy," had a super finish on his, but seemed lost in Frisco fog since his engine refused to turn. Fred Gomez who Cee-Deed the affair, ended up in fourth place which led to the comment that this was one way to stop him from winning. When the fog lifted Lee Trammel was in first place with a very creditable 56.5 mph followed by Dan Sullivan with 52.5, then Gale Stromberg. It will be interesting to compare these speeds, after more contests are held.

Up in Yuba City the Twin City Club held a meet to sharpen up for the coming NEFFC meets, with a five-minute limit on flight times. They decided ties by selecting as the winner the flyer who had the lowest total engine run. It was a day where the smart guys got their flights in early, since it was a little windy. Then what happens? At one o'clock it was calm! Careful, fellows.

Frank Hauser, who is President of the Club, proved just a little "hoggish"—he walked off with not one, not two—but *three* first places. Don't know what happened in Class A, but Al Grenoble won this event, topping all times with a 14:33, some real mean flying.

The Reimers—Charles, Robert and Mrs. Charles along with Mrs. Edna Grenoble did

all the hard work and ran the contest. They intend to conduct these as monthly affairs which will be a good measure of how often guys can tie with a five-minute maximum. They issue an invitation to one and all to compete in these meets; drop a card requesting dates to Twin City M.A.C., P.O. Box 91, Yuba City, Calif.

Two of the SCMA clubs recently held elections. The San Valeers elected returning Paul Gilliam President. Bill Krecek Veep. Del Harbold Secretary-Treasurer, and former Nat Champ Bob Holland Secretary. The High Tailers elected that high-flying youngster Gene Wallock President, with Russ "Wakefield" Johnson as Veep, Allen Ishikawa as Secretary-Treasurer. Incidentally, Allen was club champion last year with 722 points, far outstripping Gene Wallock who had 587.

BACK COPIES

"AT" 1951 Model Annual—50c
"AT" 1952 Model Annual—50c
Air Progress for 1953—50c

Air Trails
304 E. 45th St.—NYC (17)

Bob Moncrief has cooked up a sure-fire procedure on how to loose tempers at contests. 1. Remove prop nut and place carefully on rag on tool box. 2. Remove broken prop. 3. Wipe engine clean after shaking dirt (?) out of rag. 4. Put on a new prop. 5. Where did that blankety blank prop nut go? Incidentally, did you know that the nut from your booster terminal makes a real good prop nut for a Torp .049?

Earl Cayton reports by way of the "Sky-Cat Tail Twister" that the Olympic meet was a big success. Several of the Sky Cats attended the contest, with Larry Liljequest bringing back two first places. Earl says the flying was under good conditions with some innovations in operations which would improve most contests. In the first place the officials were a businesslike group who really knew their job. The timers were stationed at two separate tables so that when you were ready to fly you checked in at the nearest one and waited your turn—no yelling for timers. When the competition was over the winning times were announced so that protests (if any) could be made, then the prizes were handed out rapidly and early so that out-of-towners could get an early start home. He says the prizes were worthy of note, no worthless merchandise.

A note to those cities and towns that think certain models noisy and troublesome. The following is an excerpt from "Your City," which is an annual report to the citizens of Alameda. We quote: "The Model Airplane field of Bay Farm Island, sponsored by the Alameda Model Engineers Club had a total attendance of 24,000, of whom about 6,300 were children and 17,700 were adults." The City Recreation Department and the Model Engineers both work toward wholesome recreation of the youth of that city. In doing this 6,300 children were provided good, clean recreation without having to hang around on street corners.

—DICK EVERETT

CONTEST CALENDAR

List meets here! Advise Air Trails 90 days in advance to do the most good for your meet. If any area restrictions on entries, be sure to state. Address of contact man in same city as site of meet unless otherwise specified. Where info on events is furnished these are abbreviated as follows: indoor rubber powered—IR; outdoor rubber powered (unlimited)—ORU; outdoor hand launched gliders—OHLG; indoor gliders—IG; towline gliders—TL; free flight gas—FF; control line speed—SP; control line scale CLSC; control line stunt—ST; team racing—TR; combat—COM; radio control—RC; rise-off-water free flight—ROW; carrier models—CAR; free flight scale—FFSC; non-flying exhibition scale—NFSC; jet speed—J; controline endurance—CLEND; Wakefield—WAK.

April 19—Albuquerque, N.M. S.A.K.M.A.C. record trials. J. B. Cahill, 205 Bryn Mawr Dr., S.E.

May 3—Livermore, Calif. Oakland Cloud Dusters Half-A F/F team contest. Hal Roth, 2224 Grant St., Berkeley 3, Calif.

May 30-31—Boston, Mass. Seventh Annual Plymouth meet.

May 30-31—Yuba City, Calif. 4th Exchange Club meet. Twin Cities MAC, Box 91.

May 30-31—Scottsbluff, Neb. Peanut Pilots meet. C. H. Adkins, 2017 Broadway.

May 30-31—Marysville, Cal. 4th Exchange Club meet. L. C. Armstrong, 229 B St., Yuba City.

June 21—Johnsville, Pa. Phila. Plymouth Dealers' meet.

July 27-Aug. 2—Lakehurst, N. J. & Willow Grove, Pa. 22nd National Championship Contest. A.M.A., 1025 Conn. Ave., N.W., Wash. 6, D.C.

Sept. 7—Far Hills, N. J. Bedminster-Far Hills Meet.

Sept. 20—Harrisburg, Pa. Penna. State Exchange Clubs' meet.

Sweeping the Country!
Wasp...a "NATIONALIZED" engine!
The Wasp .049 really took over at the 1952 A.M.A. Nationals...setting two new A.M.A. records...rolling over toughest competition to take FIRST PLACE in every ½A event...as well as scooping up most of the 2nd, 3rd and other place wins! These were not "special Nationals engines"...just the same performance-tested Wasp power plants that are seen more often in the winner's circle than any other engine!
Yes—whether you're a beginner or an expert—whether you've got trophies in mind, or just enjoy flying the finest—the easy-starting, dependable WASP .049 has everything you want.
Wasp .049
DISPLACEMENT
Free Flight Combination $6.75
U-Control Combination $6.50
Back Cover 50
The WINNERS use the WASP!
Now manufactured by
HOLLAND ENGINEERING CO., EL MONTE, CALIF.

CURTISS P40F GAS MODEL

New Improved Model

48" Span. Free flight or U Control

Improved with new 2¾" alum. spinner and 3" Veco alum. disk semi-pneumatic rubber wheels. Planked type body, parts printed on balsa, and all parts. Set **$9.00**

REPUBLIC P47D GAS MODEL

35¾" span, ⅞" scale. Length 30½". One-piece moulded, clear plexiglas cockpit enclosure. 2½" scale alum. disk rubber wheels. Body planking full size plans. Uses B or C motor. Set **$5.95**

9' TAYLOR CRAFT GAS MODEL

9 foot Span. Can use Radio control. Set has 36 ready cut wing ribs, cut plywood body formers, 16" carved prop. tail wheel unit, 2 full size plans, printed balsa, silkspan, etc. Uses "C" type motor, single, twin, or 4 cyl. motor. Set without motor or wheels, postpaid..... **$17.50**

Extra pair of 4½" airwheels, $3.00

VOUGHT F2G GAS MODEL

41" span. U Control B or C Motor. Scale model of 1949 Thompson Trophy winner. Set has 2½" scale rubber tired alum. disk wheels 4¼" aluminum cowl, body planking, moulded, clear plexiglas cockpit enclosure, plastic spinner, etc. This is one of the finest equipped models in the world. Const. set..... **$7.00**

Stearman PT17

Set has 2½" celluloid motor, plastic prop. etc. 23" span. Const. set..... **$2.95**

N. American B-25

53½" span. ½" scale. Const. set. Rubber driven... **$4.00**
Gas model type..... **$7.00**

Grumman-F3F1

32" span. 1" scale. Const. set. Rubber driven... **$3.75**

Elf 4-Cyl. Gas Motor

Elf ⅓ h.p. 4¼" wide. Price **$49.50**

BOEING PT17 GAS

45" Span. Can use 5 cyl. M5 motor to scale or B or C type motor. U control. Set has scale rubber wheels and all spec. parts, ready cut wing ribs, tail wheel unit and wheel. Const. set.. **$9.95**

Add 25c for postage. Catalog—10c coin

MINIATURE AIRCRAFT CORP.

83 Low Terrace, Staten Island 1, N. Y.

R/C Roundup

(Continued from page 10)

port, New Brunswick, N. J. These boys have things organized right; spectators are not allowed to drive on the field, though there is a large parking area where they may leave their cars. The day we were out, the Missiles had about a dozen planes flying. Some of the lads are really hot at aerobatics—boy, how we would love to be able to do rolls with rudder only, as ably demonstrated by Frank Yuhasz!

We have heard from Blaine Stone and Bob Hahn (1453 Westwood Ave., Lakewood, Ohio) who have recently completed a Live Wire with Aerotrol equipment, and would like to get in touch with any R/C flyers in the vicinity; they are both 13 years old, and could doubtless use a little good advice on R/C flying and maintenance.

Sunny Florida is heard from, through Ray Megerian in Clearwater, who has been active both with R/C planes and boats. Ray has made up several proportional control actuators for friends, and says he will turn out further copies for twelve bucks, for those who don't want to bother making their own. He has been trying out various hard tube receivers and finds that the National OSR quench coils work well in most of them. These coils may be had from National Co., Malden, Mass., or from most of the large mail order radio houses (see our Buyer's Guide in the Jan, '53 issue).

Q and A. Questions still come in on that hard-tube receiver circuit we had in the October Column. David Lederman (Brooklyn, N. Y.) wants to know what frequency it is intended for, and what size wire to use on the tuning coil. It is for 27¼ mc., and the coil could be made from wire of about #18—it is not critical. The grid condenser is 100 mmf. Clarence Huddle Jr. (2040 Norman Way, Sacramento 21, Calif.) would like to get in touch with someone out there who has had success with hard tube sets. Says he just can't get them to work. He wonders if our circuit was in error, since we show the gridleak running to B plus. No, this is correct; such a connection is often used in super-regenerative receivers.

Bowmanstown, Pa., is heard from through Clyde Hall, who wants to get into R/C. We suggest he obtain the three R/C books we have mentioned in past issues, and also go over these Columns, and other R/C material that has appeared in Air Trails and the A.T. Annual in the last several years. Clyde is interested in the Bonner Compound escapement, but doesn't see just how the third position can control a glow or diesel engine. You have to use another escapement for this; said escapement has valves that operate two needle valves on the engine. (See page 10, Nov. '51 A.T.) Or use the idea sketched this month.

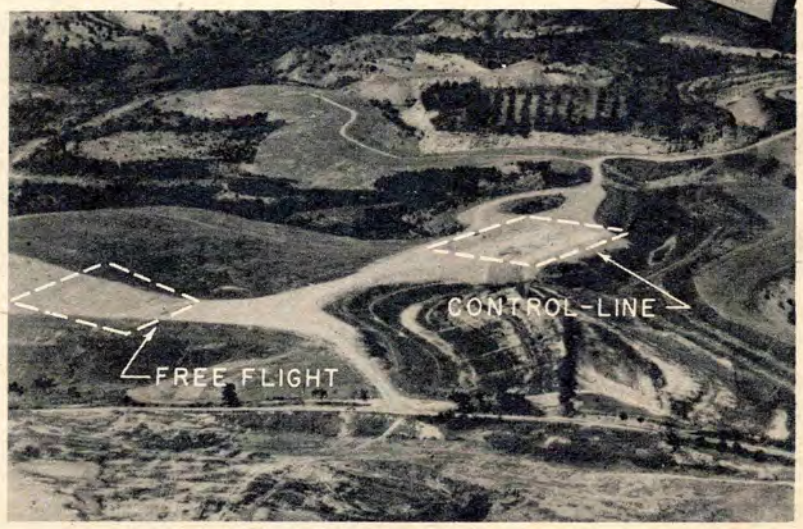
Welcome, Ladies! Paul Johnson of Des Moines says that his wife, Lois, has been flying her radio plane for some time and doing fine with it. She has entered only one contest so far, but took 5th place, out of a field of 15 entries. This is one of Paul's designs, which Lois built herself, and has a feature that might be used more in the future; in it, Paul tried the idea of hinging the rudder at an angle. The hinge line slopes to the rear at the top, and also, most of the rudder area is in the upper part. The Johnsons have found this makes for very stable flight, as the ship just won't spiral dive—a nice feature for the R/C beginner. They find, though, that it takes a lot more rudder movement to turn the ship; the turns are flat, with little tendency to nose up or down.

Technical Items. Several readers have expressed interest in a transmitter that would operate with the full 5 watts input authorized by the F.C.C. on 27¼. We are strongly of the opinion that this much power is not needed for reliable R/C up to, and even far beyond, the range of vision. Still, the extra power *does* give a bit of a safety factor, if things aren't tuned up quite on the nose, the antenna loading at the transmitter is not right, or the batteries are down somewhat.

There are many ways to get more power, but most of them require the use of 6 V. tubes, since most of the battery tubes won't stand 5 watts input, nor will the crystals, if used in some of the popular circuits. One way to do it, with tubes and crystals that are now in wide use, is to connect two tubes in parallel. This will give a husky boost in power, and if you use a pentode circuit, the crystal current will stay within reason. We suggest the circuit shown in the April '52 Column. Just connect the ele-

(Continued on page 68)

A "model" flying field serving the tri-state area around Pittsburgh, Pa., is Hillman's Model Wings Airport made available by James F. Hillman, president of the Harmon Creek Coal Corp. Fenced C/L circles and paved F/F areas are features; rest rooms, refreshment stand, benches permanently installed.



You're Invited!...

to meet with some of America's foremost model plane designers, record holders and contest winners . . . fellows like Bob Brawner, Herb Davis, Frank Parmenter, Carl Hall, Ed Lidgard, Gary Christiansen, Chuck Wood, Bob Hatschek, Howard McEntee, Pat Massey.

IT'S AN "ANNUAL" GATHERING!

Yessir, once a year the country's outstanding modelers meet with America's best-informed air-model fans through the 96 pages of Air Trails Model Annual . . . this year the editors have produced an issue that you just won't want to miss. Here's a quick run-down on just a few of the many, many helpful ideas illustrated by that master airman-artist H. A. Thomas: quick soldering on the field, hidden stooges, simple team racer construction, how to measure thrust offset, balloon-plus-regular pressure tanks, pipe cleaner brushes, test stand for rubber motors, pepping-up machine-cut propellers plus scores more!

IT'S A "MUST" BUY FOR EVERY MODELER

No matter what kind of model airplanes you build you'll find a tremendous amount of informative data in the 1953 "AT" Model Annual. It deserves a place of honor in your model library along with each of the other "AT" Annuals. A half-buck invested this way will pay plenty of dividends in better models, faster building, more fun in flying.

GET THE ANNUAL THREE WAYS!

The big, exciting new "AT" Annual is available at leading hobby shops, from your newsstand dealer or by mail directly from Air Trails. If you can't get a copy locally send 50¢ to "AT" (if you live in the U. S. or Possessions). Canadian modelers should send along 60¢ for a copy, and enthusiasts in other parts of the world can have a copy for $1. Believe us, it's worth a lot more than that! We urge you to send your order right now . . .

LAST MINUTE REMINDER . . .

If you've a model building buddy in the service he'd sure appreciate a copy of the Model Annual from you . . . he'll get a big charge from the opening "Hail the G.I. Modeler" . . . and every aeromodeling addict will be specially interested in "Modelplane Progress" report prepared by Cal "Carrier" Smith with the assistance of Dick Everett and Frank Zaic . . . need we say more? Send along that coupon and send it now!

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model annual
for 1953
50 CENTS
Special Feature
"START YOUR OWN MODEL PLANE CLUB"
Over 100 Model Plane Plans, Photos, and Diagrams
The best in Control-line and Free Flight Airplanes—
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RELIABLE, EFFECTIVE RADIO CONTROL
TELECOMMANDER

- Lightweight
- Compact
- Sturdy
- Reliable
- Low Cost
- Guaranteed

No. 951A Receiver

This outstanding receiver is housed in a strong, lightweight, bakelite case. Incorporates a field-tested hard tube circuit in minimum space. Permeability tuning assures positive hairline adjustment. Includes built-in relay. Unit is ready to install and operate. Very low cost. Size: 1½ x 2½ x 1¼" Weight — with tube: 2½ ounces. High Tension Voltage: 60-90v. Low Tension Voltage: 1.5v. Price (complete with tube): **$18.95.**

TRANSMITTER

Completely wired. Uses 3A5 twin-triode tube. Size: 4 x 4 x2". Weight: 14 ounces. High Voltage: 120-150v. Low Voltage: 1.5v. Input: 4.8 watts. Complete with battery switch, crystal and tube. **$18.95.**

RELAY

The lightest, most sensitive and reliable relay in the model field. Operates on current change of 50 microamps between .5 and 3 milliamps. Solid silver contacts. Size: 1 x 1¼ x ⅜". Weight ½ ounce. **$6.50.**

ESCAPEMENT

Light, positive-acting, compact. Interchangeable rotors are ball-bearing mounted. Uses only two pen-cell batteries. Size: 2½ x 1¾ x 1". Weight: ⅞ ounce. Voltage: 3v. **$5.00.**

Transmitter accessories — available separately: key lead, tubes, meter, crystal, antenna. Reasonably priced.

FULLY GUARANTEED . . . all Telecommander radio control units are guaranteed for 90 days against defective materials or workmanship.

AMERICAN TELASCO LTD. HUNTINGTON, N. Y.

THE SHADOW

Sponsored every week over the entire Mutual Broadcasting System by Wildroot Company, Inc., makers of Wildroot Cream Oil hair tonic and Sylvania Television

MUTUAL BROADCASTING SYSTEM

(*Continued from page 66*)

ments of another 3A4 in parallel with those of the tube shown. It will probably be necessary to cut the screen resistor down, and possibly also the gridleak. Such an arrangement should be capable of about 40 ma. at 150 V. input—right on the nose of 5 watts. Don't try this with the 3A4 triode-connected circuit—the crystal current would be way too high.

Al Trefethen comes up with another idea, of interest to those hardy R/C boys who fly all winter. As others have found, Al noticed that his batteries just wouldn't put out enough juice, when the temperature got down low. Even if warmed up before a flight, they would soon cool off, and cause erratic receiver and escapement operation. He then added a small heater to the batteries, and now can fly in zero weather if he wishes. No kidding—you just get one of the little hand warmers that work on light fluid (they are sold by Sears and, no doubt, by many other stores), and strap it over the batteries which are packed flat in the plane. Works fine, if your ship can carry the small extra weight.

Frank Schmidt has done a lot of work with motor-driven servo controls, and found it difficult to prevent the motor inertia from carrying the control arm past the limit switches, or past the neutralizing switches. After a lot of snooping in the toy shops, he found a little item that cures this completely. It is a gear train assembly and speed-limit device that comes in a toy made by the Automatic Toy Co., Staten Island, N. Y., and sold as their No. 200 Toy Speedway; cost is $1.98. There is no load on the drive motor until it gets up to a certain speed. From then on, the speed is held constant, and the motor can't run any faster. He uses this regulator and the gear train that comes with it, in conjunction with plastic Model Pike electric motors.

Commercial News. We note with interest that manufacturers other than those putting out R/C equipment have our problems at heart. For example, look up the valuable info on props for R/C use in the Tornado ad on page 57, January issue.

Polk's Model Craft Hobbies (New York 1, N. Y.) have announced their new line of E.D. Aristrol equipment. Transmitter is improved in several respects, including addition of R.F. chokes to key leads, and inclusion of a meter jack. $57.50 for the receiver, transmitter, and escapement. Line now includes two complete receiver outfits that feature the receiver, escapement, with necessary switch, pot, and plug and socket, all wired and packed in a fitted display box. To demonstrate, the dealer just plugs in the necessary batteries—the box even has a compartment for these! Called "Boomerang" units (because they bring the plane back to you!), outfits sell at $29.50 for gas tube version, and $29.50 for the new hard tube set. All this equipment is for 27¼, of course.

Electronic Model Engineering Co. (6127 Alta Ave., Baltimore, Md.) has developed a new receiver, which operates on the super-heterodyne principle. Five tubes plus a crystal detector are used, and the features are great sensitivity and wide tolerance to battery voltage changes. 90 V. B. is normally used, but perfect operation is had when this drops to 75 V. or less. The receiver weighs 12½ oz., but it is expected that this will be considerably reduced. A two-tube 5 Watt transmitter will be made available, both in finished and in kit form. The receiver is still under development to reduce weight, though it has seen considerable use.

Modelers around Baltimore have been flying proportional control for some time, using a device developed and to be marketed by Brayton Paul, which he terms a "flyball actuator." It is attached to a small plastic motor, and has proven simple and effective, with lots of power to move the rudder. Price will be around five or six dollars complete with motor (6127 Alta Ave., Balto. 6, Md.).

Many new items of interest on new price list for R/Cers, put out by Electronic Specialty Supply Co. (58 Walker St., N.Y. 13, N.Y.). They have a 1 1/16" dia x 5/16" thick disc magnet for actuators; has ⅜" hole in center (easy to plug with brass), sells for

$1.25. Other items include those scarce Sigma 4F and 5F relays in several ohmages, etc.

Control Research (Box 9, Hampton, Va.) will have low-priced R/C test meter affording two voltage and current ranges, in 4" x 4" x 2" case, and built around good grade moving coil meter. Will be sold as kit or all finished. Also have high-grade surplus moving coil meters in 0-5 and 0-50 ma. range for receivers and transmitters—$5.00 each. Have good stock of alnico magnets suited to moderate sized actuators; these measure ¾" dia. x ⅛" thick, and have 3/32" hole. Use a pair of them for more power; cost is 35c each or three for $1.00.

C.R. also carries a new miniature motor now appearing in hobby shops, and called the Hi-Drive. The big feature is that the brushes are not those thin metal strips—they are tiny carbon blocks and will last a long time. Motor is well made and powerful; it is intended for 1½ to 6 V. and weighs 2.2 oz.

Flame-Out at 33,000!

(*Continued from page 23*)

landing. The Sound is very rough today—four-foot waves with a 15 to 25 knot wind. The water temperature is 45 to 48° F. I had never made a jump or a water landing but I decide to try the water landing.

At 3,000 feet, I come through a hole in the low clouds and abandon my starting attempts. I'm busy now. I have to get all the equipment switches on, all the engine and fuel switches off, get the emergency hydraulic system in operation. The canopy opens, the flaps come down, I tighten my seat and shoulder straps and get off my last radio call.

"Grumman tower from flight 16, I bear 070 degrees from Old Field Point—distance 10 miles. I'm two miles off shore."

I hold the air speed at 120 knots and look down. Those waves are too big! Better not hit them head-on. I angle the plane 20 degrees out of the wind and waves and in we go. *Bang*—the jet smacks the top of a big wave and bounces back into the air. She flies over two more waves and smashes into another big one. My body tries to hurtle forward but the straps hold me securely. The plane comes to a stop in nothing flat.

I open my belt, remove my oxygen mask, and unbuckle my chute as a wave slaps in. I stand up in the seat and find myself and the plane all in one piece. Another wave comes in and I realize that the plane, with its heavy fuel load, is sinking fast. I pull the toggles on the life vest and experience the feeling that I'm stepping on a giant marshmallow—the harder I try to push, the mushier it feels. No wonder—I'm in the water and I turn around and find the airplane gone—no suction, no sound. Only the seat cushion remains, bobbing on the waves

(*Continued on page 72*)

Now.. INTERNATIONALLY FAMOUS!

A new official Mexican ½A Free Flight, R.O.G. record was set by Carlos Gonzales de Cosio on October 25th, 1952! His .049 SPACE-BUG easily powered the 200 square inch plane, carrying its 5⅓ ounces aloft smoothly, quickly—time under power was 16 seconds each flight.

Once more the amazing lifting power and performance of the SPACE-BUG confirms enthusiastic reports from modelers, dealers, experts and beginners throughout the U.S.!

Ask YOUR model dealer to show you the sensational new .049 SPACE-BUG . . . the first really different engine since the introduction of the glow plug!

You'll Like the Space-Bug's

- *easy starting . . . even when brand new!*
- *power to stunt ships most .049s will barely fly!*
- *un-matched, up-to-the-minute engineering features!*

Thimble-Drome .049 SPACE-BUG

$6.95

Other Thimble-Drome Hits for '53

HANDY REEL $2.95
Now have a reel for every line!

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OVERALL LENGTH 8"
1/4"=1' SCALE

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1/3"=1' SCALE

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OVERALL LENGTH–11 7/8"
5/16"=1' SCALE

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F-51 MUSTANG

WING SPAN – 13 3/4"
OVERALL LENGTH – 12"
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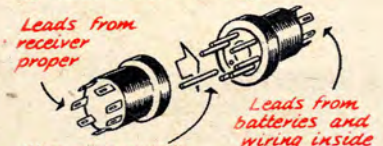
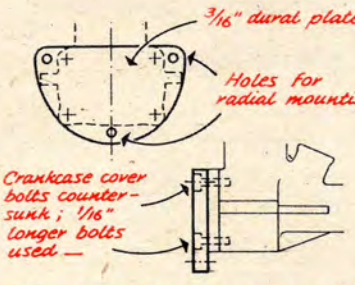
Radio-control model fitting for quick dis-connect plug-ins made from miniature tube sockets by John Beal, Warrington, Fla.

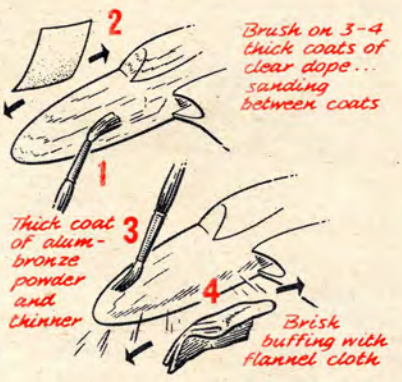


Sketch-book

Have you developed something new in construction, control or flying? Send a rough sketch—we'll re-draw it and pay $5 for each accepted. Contributions should be original ideas; because of the large number of entries the editors regret they cannot enter into correspondence regarding Sketchbook submissions.



Many builders prefer radial mounting for freeflight and radio-control jobs... Bob Osburn, Texas City, Tex., made this radial adapter mount for K & B Torpedo '19 ——



Lt. I. Strandberg, Swedish solid modeler, sought "real metal brilliancy"; finally gained it with this model finishing procedure ——

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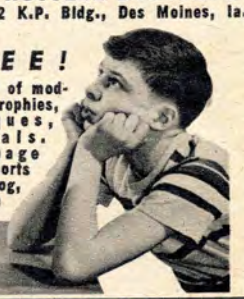

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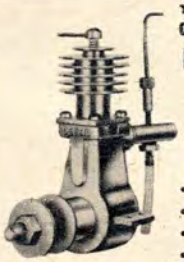

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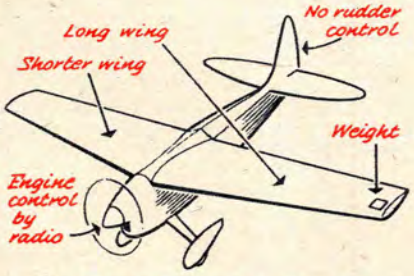
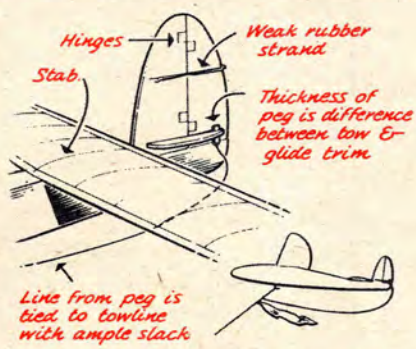
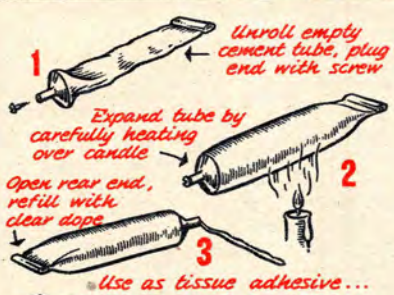
Flat surfaces can be quickly and more evenly covered by rolling tissue strip on dowel reports Gordon Wheipley, Phoenix, Ariz.



Thought-provoking idea sent in by Ray Greene, Dearborn, Mich.: R/C directional steering via motor control . . . long wing lifts, turns right in hi-speed; drops, turns left in low speed. Medium speed = straight?


Hinges
Weak rubber strand
Stab
Thickness of peg is difference between tow & glide trim
Line from peg is tied to towline with ample slack

Frank Cummings, Los Angeles, Calif., noted contest winner, prefers this thoroughly tested "auto-rudder" which allows straight tow, then offsets for turn in glide —


1
Unroll empty cement tube, plug end with screw
Expand tube by carefully heating over candle
2
Open rear end, refill with clear dope
3
Use as tissue adhesive . . .

Discarded cement tubes are reclaimed as dope dispensers by Robert Walters, Hamburg, N. Y.

IN OUR NEXT ISSUE: The high-time model from the National Meet, "Pay Up" by Richard Sladek, is scheduled for the April issue of Air Trails. This is one of year's most significant F/F models.

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Monarch's famous "SPITTIN' IMAGE" models — the Curtiss P-40F and Spitfire have won acclaim as the greatest half "A" CONTROL LINE scale gas models ever created. And for good reason . . . for here is design at its best—PRE-FABRICATION AT ITS GREATEST! These models are remarkable both for outstanding craftsmanship and the faithful adherence to every line and contour of the actual airplanes. Here are scale gas models that look like "the real thing". For ease and speed of assembly — for sturdiness and realistic performance in flight — these models are in a class by themselves. The contents are lavish — SPINNERS, huge illustrations, multi-colored decals, and all the luxurious extras you would expect. Priced at $3.95 each at your Dealer now. By mail, add 30¢.
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(Continued from page 69)

and blowing downwind.

I'm floating in the Sound. I can see Long Island far in the distance. The strong wind makes a hissing sound as it kicks up the waves. Time to show people where I am. I open up a small packet of dye on my life vest and it puts out a brilliant yellow-green stain on the surface of the water. Five minutes later Connie is overhead in the Goose and Tom Attridge, another Grumman test pilot, is circling in a Grumman Guardian anti-submarine plane.

Connie circles and comes in low. Probably he'll buzz me to show me he's seen me. This area is no place to land that little amphibian. Oh, oh, he's going to try it! *Splash*—a wall of spray shoots up and engulfs the amphibian but she rides it out and comes to a stop. With the spray obscuring his view, Connie can't see me in the water, but Tom, circling overhead, directs Connie to my position. This takes about three minutes. Connie taxis the plane over and puts it in position for me to grab the left wing float. Rollie is waiting in the rear hatch with a line and life preserver. I push off the float toward the hatch and Rollie heaves the line. A perfect strike. I grab the line and Rollie hauls me to the hatch. It's all over now. So I think. I try to climb aboard with Rollie pulling to help. No go. The cold water has left me limp and I can't do any more than hang on. With my watersoaked clothing, Rollie can't lift me in.

He calls to Connie, "I can't get him in —I'll need some help."

This is bad. The plane is bucking and pitching in the heavy sea and needs expert handling. Connie takes a chance and runs back from the cockpit, reaches over with Rollie and they haul me aboard. The hatch is closed and Connie and Rollie run forward to ready the plane for take-off. Connie waits for a reasonably smooth stretch of water to appear, and we smash across the sea into the air.

Only now do I feel the tremendous cold in which I was soaked. I start to shiver and keep on shivering for an hour in the first-aid room back at Grumman. Six blankets, hot water bottles, and massage finally restore the circulation and I begin to change from blue-white to a normal color again.

The whole episode—from the time I got into my Panther until I returned to Grumman—took scarcely an hour. The next morning I have a very stiff neck, a sore wrist, and a complete set of water-logged equipment to remind me of the previous afternoon's adventure that began with a flame-out at 33,000 feet.

Youth in Aviation

(Continued from page 16)

(100 meters).

Hand Launched Gliders: Both outdoor and indoor now have only one class of glider. All classes of outdoor gliders were combined as were those of indoor.

Flying Scale: In flying scale control line the stunt requirement was eliminated!

F/F Scale: The final rules have gone to the committee for the finishing touches. They are going to be patterned after the 1952 Nats rules and will use .05 Half-A engines. Rubber power flying scale was eliminated.

To generalize a little: the age classes are unchanged; the Contest Board is going to establish a standard point system for selecting a National Champion. You can use a model in any number of events so long as it will conform to the rules of events entered. There are a few other

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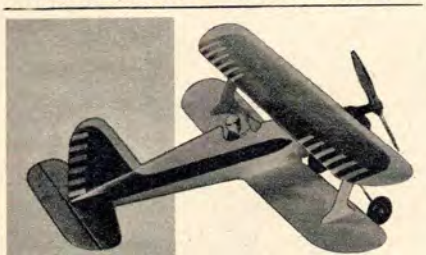

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Antique Autos Weaving Casting Shellcraft

items such as requiring the contestant to build his own model and enforce the ruling through A.M.A. officers and clubs. If your A.M.A. numbers aren't at least 1" high you better stretch them because it's a definite and sure rule.

Thanks go out to all the 1952 Contest Board members, Advisory Committee and the officials at the Academy Headquarters for their support in the formulation of new rules.

If you didn't bother to vote don't bother to gripe if you don't like our new rules.

Space Bug

(*Continued from page* 48)

was outstanding at 14,000 to 17,000 rpm. Plenty of power was delivered at 10,000 rpm but there was some tendency to overheat.

A special racing kit is available for hopping up the "Space Bug." It consists of a special tank with a large air intake and a high compression head. Changing from the standard tank to the racing tank raised the rpm from 15,200 rpm to 17,200 rpm on the same propeller. Changing to the high compression head should give even higher rpm in certain weather conditions.

The "Space Bug" is an outstanding engine in design, workmanship and performance.

Engine Data

Performance. Weight: (with tank) 1.6 oz.; (without tank) 1.16 oz. Propellers: 7/4 wide blade wood, 10,500 rpm. 6/4 wide blade wood, 13,200 rpm. 6/3 plastic coated wood, 15,200 rpm. 5/3 plastic coated wood, 19,600 rpm. 6/3 plastic coated wood, 17,200 rpm (on racing carburetor). Fuel: Thimble-Drome fuel. Fuel level test: 10" at 15,200 rpm, standard carburetor. 7" at 17,200 rpm, racing carburetor.

Design Data. Displacement: .0499 cu. in. Class: Half A. Stroke: .386 in. Bore: .406 in. Stroke bore ratio: .95. Compression ratio head: 6.5. Compression ratio base: 1.41. Port area intake: .0163 sq. in. Bypass: .0098 sq. in. Exhaust: .070 sq. in. Ignition: built in glow plug.

Construction Features. Reed valve intake. Carburetor in center of fuel tank. Crankshaft relieved in center to reduce oil drag. Precision fits. Glow plug built in cylinder head. Rounded top on bypass port. Bearings: crankshaft, bronze bushing; crank pin, aluminum; wrist pin, aluminum.

Parts Illustrated

1. Fuel tank (regular): die-cast aluminum, 1⅛" dia. x 1" long, .37 oz. 2. Cylinder: steel, .406" bore x 15/16" long, .40 oz. 3. Cylinder head gasket: copper, .010" thick. 4. Cylinder head glow plug: aluminum, ¾" dia., .14 oz. 5. Piston: steel, hardened and ground, .406" dia. x 13/32" long; connecting rod: aluminum, ¾" long, .10 oz. 6. Crank case: aluminum die casting, .22 oz. 7. Reed valve front: spring brass, .004" thick. 8. Reed valve rear: spring brass, .0015" thick. 9. Reed back plate: aluminum, .032" thick, .02 oz. 10. Reed housing: aluminum, 23/32" dia., .02 oz. 11. Fuel tank back: die cast aluminum, .08 oz. 12. Fuel tank back gasket: vellumoid, 1/64" thick. 13. Air filter: aluminum, .02 oz. 14. Tank nut gasket: vellumoid, 1/64" thick. 15. Needle valve: steel, .05 oz. 16. Needle valve spring: steel, .142" O.D. 17. Crank shaft: steel, hardened and ground, .187" dia. shaft, .109" dia. crank pin, .18 oz. Drive washer: aluminum, ½" dia., .03 oz. Propeller nut: aluminum, 5-40 N.C. thread, .02 oz. 18. Base gasket: vellumoid, .005" thick. 19. Mounting bolts: steel, 3-48 N.C., .08 oz. 20. Crank case bolts: steel, 2-56 N.C., .04 oz. 21. Racing fuel tank and valve assembly: .60 oz. 22. Racing head: aluminum, ¾" dia., .14 oz.

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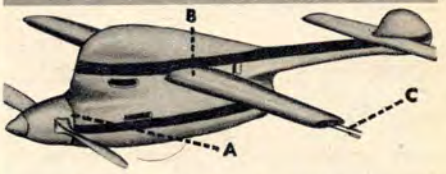

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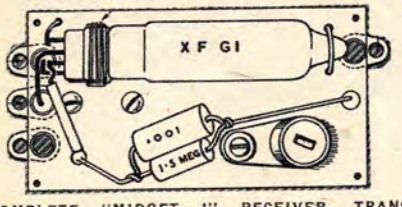

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Two-Speed Torp

(Continued from page 50)

valves. This serves to prevent the oil or fuel from collecting in the air line and blocking it by capillary action. The vent lines (3 and 4 in the photo) should pitch evenly upward to the valve with no dips that might form a trap for oil to collect. Control line models require the same precautions but the vent lines should also pitch in toward the center of the circle so fuel will drain back to the needle valve during flight.

This system does not appear to be suitable for stunt models that are to be flown inverted because the arrangement of vents above, and tank below, will be disturbed. The best applications would be radio control, carrier flight, sport, and novelty stunt where inverted flight is not involved.

The test was conducted using the equipment shown in the photograph. Vent tubes (3 and 4) were changed from 1/8 to 1/16 and 3/64 inch diameter and extended up to 20 inches with no detrimental effects, provided oil was kept out of the lines. In all cases it took less than one second to change to low speed and approximately two seconds to change from low to high speed. The average change in speed was slightly more than 2 to 1. Starting was easy on either high or low speed provided the tank was not raised above the needle valve. Raising the tank above the needle valve when the engine was running caused the low speed needle valve to kick in and would stall the engine in a short time. Comparing the rpm data with the test on the standard Torpedo .19 (Air Trails, June 1951) shows a loss of only 100-200 rpm at speeds below 15,000 rpm, due to the small bore carburetor.

Test Data

1. 10/6 wide blade wood propeller: 7,300 rpm high speed, 4,000 rpm low speed. 2. 9/6 narrow blade wood propeller: 9,800 rpm high speed, 5,500 rpm low speed. 3. 9/4 torpedo propeller supplied with engine: 13,000 rpm high speed, 5,500 rpm low speed. 4. 8/6 narrow blade wood propeller: 4,700 rpm high speed, 6,000 rpm low speed.

Fuel level test at 13,000 rpm: 15" on high speed needle valve, 11" on low speed needle valve.

Leapa Lena

(Continued from page 37)

circle is tight and the glide circle O.K., widen the power circle by offsetting the thrust with a thin washer placed behind the engine on the right side (looking down from the rear).

When tilting the stabilizer to produce a wide-circle glide, the nose may drop and steepen the glide. This can be corrected by moving the wing forward a little. The model, when adjusted to get the most from the engine run, should make a complete circle during the power run, coming out into the wind.

Dowel keys are now added to the wing and stabilizer; these should be cemented to the wood and not just to the covering, which might separate when a little strain

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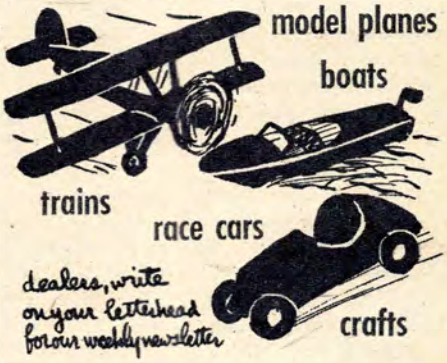

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1152—F8F-2 Bearcat; Perfidio.

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is placed on the surfaces. When tilting the stabilizer to obtain the desired circle, don't get concerned if the angle looks excessive —she'll fly all right—just keep on tilting!

Bill of Materials

1 sheet 1/32" x 3" x 36". 4 sheets 1/16" x 2" x 36". 1 sheet ⅛" x 2" x 36". 3 ⅛" x ⅛" x 36". 1 ⅛" x ½" x 36", T.E. 1 12" length 1/16" wire. 1 sheet Silkspan. 1 wheel. 1 large tube of cement. 6 oz. dope.

Dope Can

(*Continued from page* 55)

buckets, designed and built the special model which was unanimously declared the winner. Kishi, who lives in the Shinjuku section of Tokyo, had an all-Japanese model from the Enya .19 engine to the kiri wood frame and the rice paper covering. He hand-carved the 9/3.5 propeller. With that the engine did 8,000 rpm and developed about ¼ horsepower.

Kishi's clever though mechanical pigeon had a wingspan of 71 inches, a length of 59 inches, and with two ounces of payload messages weighed a total of 33 ounces.

In the winning flight, Kishi's "pigeon No. 32" climbed in tight right circles for approximately 20 minutes until fuel was exhausted at about 1,500 feet altitude. The glide which followed was in wider right circles and lasted about 5½ minutes for a total flight time of 25½ minutes. Kishi estimates that the actual straight-line flight speed of his entry was 30 mph, so it must have flown about 16 miles all told on its journey. Proving its bird-like background, No. 32 landed in a tree close inside the shore line and right in full view of several of the officials.

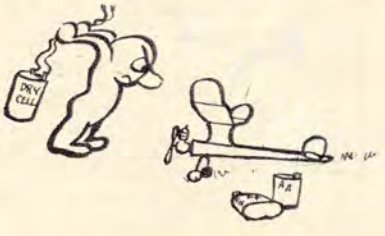
Winner Kishi, Press Mainichi and Pan Am—all very pleased with the world's first mechanical pigeon—are now mulling over the problem of how to teach these new-type birds to fly straight even into the wind!

Dallas, Tokyo. Bet you always thought Dallas was in Texas. *That* one, yes. But the one we're thinking of is Dallas B. Sherman, regional director for the Far East division of Pan Am, who sent news of the first over-water PAA-Load fixed-destination contest. One of his letters contained a hint of the tremendous amount of modeling activity in Japan:

"We have some very interesting models . . . an Air Force sergeant has a Class D controliner with 3 pounds of payload carried inside the fuselage, an ex-aero engineer is building a pusher PAA-Load free flighter, and I've visited a Buddhist priest at Kyoto who is putting the finishing touches on his pod-and-boom job! Of course, not all enthusiasm is headed toward PAA-Load; control line scale is high on the list with a 14-foot span Aeronca C-3 getting its final trimmings and several 6-engined B-36's already making the circles."

Jap Records. We are in receipt of a listing of official records from the Model Airplane Federation of Japan. A. A. Winston of America's Hobby Center sent these along to us from one of his customers. The official MAFJ events parallel those of our own AMA. The listing, which we pass along at the top of page 78, shows the high times in all categories which were established prior to the last Japanese "Nats" (their 5th).

(*Continued on page* 78)



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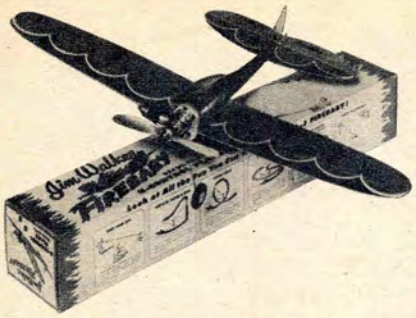

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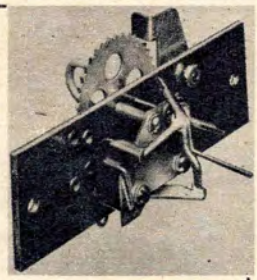

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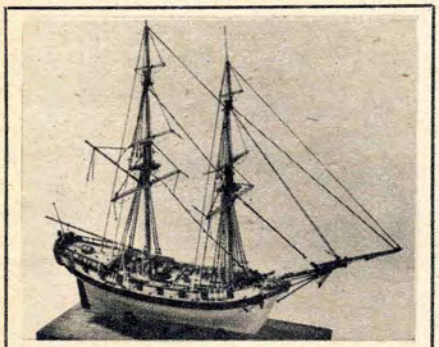

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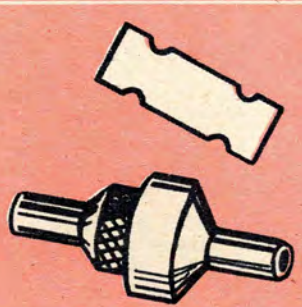
Two-foot span model of the Convair XF-92A which will go into production as the F-102, America's first supersonic delta wing fighter, comes from Miniature Aircraft Corp. Can be powered with the Jetex 350 motor. Kit sells for $4. This is one of seven: B-25, P-20, Rearwin, D-8, F11C4.

DELTA JOB



Mattie Sullivan of Sullivan Products, better known as "Nylon Ned," has two more products of Dupont Nylon. One is the "Pylon" filter at 25¢ which filters the fuel, eliminating clogging of needle valves; second item—Pylon brand hinges for 15¢. These do not bend out of shape or slip out.

Two basic books for the model builder available from A. S. Barnes Co. Both are excellent and both are by Donald K. Foote, well-known West Coast designer and flyer whose Westerner design once held all class records. "Model Airplane Engines" and "Aerodynamics for Model Airplanes"; $3 apiece.

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FINISHED SCALE

Glad to note that the Authenticast military miniatures are again available. Offered by Comet Metal Products Co., the perfectly scaled, precision detailed models are official reproductions. Walker Bulldog tank is $1.75, Kingfisher scout plane is 75¢, the Bearcat is 35¢. Escort ships are $1 each.

OLD FRIEND

Assembled for and sold by Cheminol Corp., the O&R 23 is now available packed in the familiar red, black and silver box with a new green and white band. The "23" sells for $11.95. Companion products are Cheminol's O&R No. 2 fuel at 85¢ per pint and the Cheminized O&R glow plug at 65¢.

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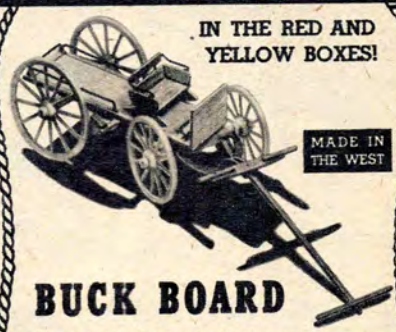

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(Continued from page 75)

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	B	17:35.6	45:00	20:38.6
Outdoor Cabin Rubber	C	19:35.6	.....	5:55
	D	18:06.2	24:10.9	.....
Towline Glider	A	.....	9:37	14:05
	G	9:15	11:20	.....
	H	15:27	.....	.....
Free Flight Gas	A/2	12:22	5:01	5:59.1
	A	22:21.5	11:04	9:00
	B	11:33.6	12:37	.....
	C	9 56	.....	.....
Control Line Speed	A	95.74 mph	88.23	.....
	B	116.13	105.88	91.37
	C	.....	.....	.....
	D	144.58	126.76	.....
Control Line Jet		137.40 mph	140.77	
Control Line Stunt		389 pts	388	211

Wakefield event, 12:33.0

PAA-Load events: A/2 gas, 13:45.9; A&B gas, 11:06.5; rubber, 2:18.0.

Seeing Red. We want you to read this excerpt from the plant newspaper of a large Eastern aircraft manufacturer. The item is headed "Engineers Investigate Aerodynamics By Model." The copy, in part, runs like this:

"Imagine, if you can, a busy air terminal. The great silver birds swoop along the runway and arc gracefully up into the deep blue of the sky. A number of helicopter engineers, standing behind the airport fence, gaze wistfully at the phenomenon, and ask themselves this question: 'Wonder what holds them up in the air? They don't have rotors!'

"Their attention is captured by a flight of wild geese across the autumn sky. Their eyes (the engineers', not the geese's) squint in wonderment and the thought begins to form in their collective little minds—perhaps there is some connection between the flight of geese and flight of airplanes!

"The engineers turn from the fence and walk away, muttering to themselves, 'But the birds flap their wings, planes don't!'

"In an effort to discover the secret of flight, a number of enthusiasts have formed a model aircraft group. By some peculiar quirk of fate, unexplainable by the writer, most aircraft engineers have built and flown model airplanes in their youth. This desire persists in some cases and, as a result, the people involved have banded together for mutual protection against those who would 'hurl the cynics' ban' and scoff."

The item goes on to report what kind of models the engineers are building. They seem to include all the regular types.

To take the most charitable view we can assume that the writer was poking gentle fun at the engineering modelers. If the author was serious, then we can only say, "$('|':!*-$!!*&?-;*!!!!!" After all a number of very well known aviation figures were modelers at one time or another, folks such as Douglas, Martin, Stout, Marquardt, Piasecki and so on.

As a matter of fact, the item appeared in the "Tandemeer" published by the Piasecki Helicopter Corp., and the "wistful" engineers with the "little" minds are Piasecki employees!

Visitors' List. Magazine headquarters have been a mighty busy place lately, according to our sec. Among those stopping by were Ray Matthews, chairman of the AMA contest board, Bill Fletcher who chairmanned the '52 Wakefield Fund, then went to Sweden on his own as manager of the U. S. team, and Mel Torme, the Velvet Fog himself, who turns out to be a top-notch World War I airplane fan. Fletcher got to chewing the fat over prospects of getting an American team to the Model Olympics when and if the big wheels combine the Wakefield rubber, the Nordic sailplane and the international F/F and control line events into one gigantic "Internationals." Bill estimates that separate teams could be sent to the four meets for around $11,000. That's figuring transportation costs out of New York; team members would have to get to the big city and home from there on their own. A combined team of 18 men

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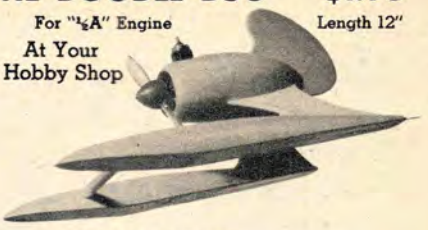

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could go from NYC to a four-event International competition for around $9,500. These costs are based on the separate meets or the combined affair being held in Sweden, England, Belgium and/or France.

A "half-manned" team to cover a combined contest would cost about $5,200. Apparently the Wakefielders are willing to help raise funds for teams in all events, providing the rubber model enthusiasts get their share. A commendable attitude.

Singer Torme wanted to know if the big German bomber used in the old "Hell's Angels" movie was the real ship. Tech Ed Dawydoff said it wasn't, but a Sikorsky in disguise—and dug up a photo of the very plane to prove it!

Matthews' work while in New York was—among other things—to total the contest board vote on new rules. Detailed information on those are to be found under the "Youth in Aviation" column.

Vela Dethermalizer. Earl Cayton, out Salem, Ore., way approves of Alberto Vela's new dethermalizer as cartooned in the January issue (a trained eagle which brings back the model). But Earl would go a step further and train the boid to attack competing craft!

7,500 Foot Record. Flying at an elevation of 7,500 feet not far from Mexico City, Carlos Gonzales de Cosio established a new Mexican Half-A free flight record of 3 perfect six-minute flights (the maximum under model rules of that country). Leroy M. Cox tells us about this and he's mighty pleased since the new record holder used one of Roy's new Space Bugs to do it. The model had 200 square inch wing, weighed about 5 1/3 ounces.

Mr. Cosio was one of the club members from Mexico City who participated in the Nationals at Los Alamitos in July. He obtained his engine from the factory during his visit there at that time, being one of the 15 to receive such engines which were given away for purposes of observation by the factory as to performance and consumer reaction.

Call All (Race) Cars! Can anybody supply any dope on the existence of a national model race car club? Readers keep asking, and we'd like to help them if we possibly could.

Father and Son Operation. Good news from Shanks Village, N. Y. There's a very active Father and Son Flying Club of Rockland and Bergen Counties that includes about 35 dads and 45 youngsters. Adults with no offspring who are interested and want to help are teamed with proxy "sons" whose own dads just don't have the time to participate. The Dumont, N. J., Recreation Association has been mighty helpful. President of the F&S FC is Billy Newrock, Sr., of that community. Most popular events for the father-son teams are combat and team racing. The youthful members start at five and go on up through the teens. The small fry are kept busy with hand-launched gliders.

New Carrier Event Rules. Lt. Cmdr. Howard B. Eddy of the Navy has passed out the new 1953 rules for the carrier event. No drastic changes, but some excellent modifications. You can get a four-page set of rules and diagrams for constructing a model carrier from that gentleman at Navy Office of Information, Room 4D-718, Pentagon, Washington 25, D.C. (Also *free* three views of the AD, D-558, F2H, F2H-2P, F8F-2, F9F-2, F9F-5, AJ-1, SNJ, FJ-1, SB2U-1, 02U-1, OS2U-1, F4U-5N, F7U-1, SBU-1, TBU-1, VE-9).

Some carrier event changes: tail hook cannot exceed half the length of the model; if you touch down after taking off the carrier you are presumed to have crashed—you get points up to that time but that concludes one attempt; all models must fly counter-clockwise under 20-foot ceiling; you get three points for every mile per hour in the spread between high speed and low speed runs; points are no longer given for take off.

We Hear . . . From Ed Lidgard of the American Wakefield Committee: "About 3 months

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ago I got in an accident up in Canada and ever since have had a 14-inch cast on my left wrist. Maybe I'll get it off in 2 months more. Sure interferes with model work. Also lost 8 teeth and a lot of hide off my ugly puss. In another month I go to Chicago to have it sanded down—literally. Wonder if they'll polish it with 10/0?" Ed, sorry to hear of your misfortune, know the gang joins in sending warm regards; we all hope you'll be improved in time for the Wakefield flying in the spring.

Bob Tennenbaum, 461 Fort Washington Ave., New York 33, N.Y., has formed what he calls the International Helicopter Society which has pen-pal members in England and the U.S. If you're interested in rotary wing aircraft he'd like to hear from you.

Quote and double quote: "I hope the plans of the Civil Air Patrol to run a scale model contest for the Cadets go through. As an adult member of this organization I've attended many drill competitions, but never have had the interest I would have had if the prizes had been for models."—*A.H.M., Inglewood, Calif.*

Frank Zaic has reprint edition of the new Model Aeronautics Yearbook and the price is now $1. Copies are available from Model Aeronautical Publication, 203 E. 15th Street, New York 17, N. Y.

California Show. One of the most unusual and challenging contests ever held West of the Rockies will be conducted over a ten-day period when the world's biggest hobby show opens on March 20 in Los Angeles.

K&B's Lew Mahieu and Duro-Matic's Keith Storey, top flyers in their own right, will be directing the round-robin "Tournament of Champions" at the Fifth Annual California Hobby Show.

Contestants will be limited to place winners in previous contests. There will be 4 divisions: Combat, Stunt, Speed, and Glider.

"Around 150,000 persons will attend the hobby show. By choosing top-notch modelers and the newest type events, we hope to put on a contest that will stimulate public interest in flying," Mahieu and Storey said in a joint statement. The F.A.S.T. Club will give demonstrations.

All events will be flown indoors—in the high, fenced U/C circle in the Shrine Convention Hall. All power events will be limited to Half-A U/C. And planes will be flown on lines of 22 ft. or less.

Competitors for one of the big perpetual trophies and other prizes will enter four divisions: Combat, Stunt, Speed, and Glider.

Glider flying is scheduled nightly, to convince the younger generation that they may start flying for only a few cents and still have fun.

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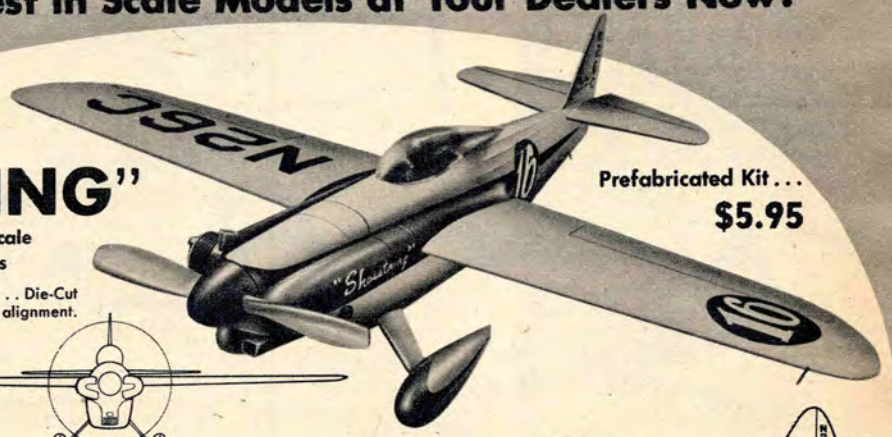

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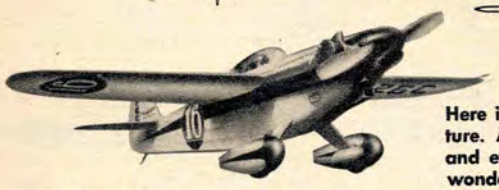

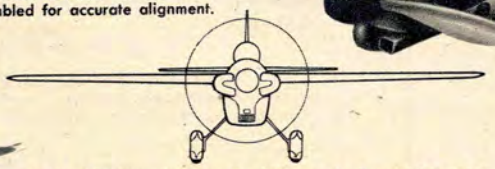

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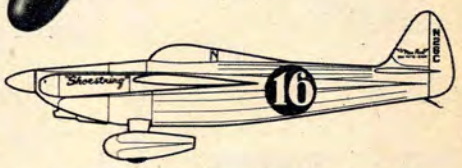

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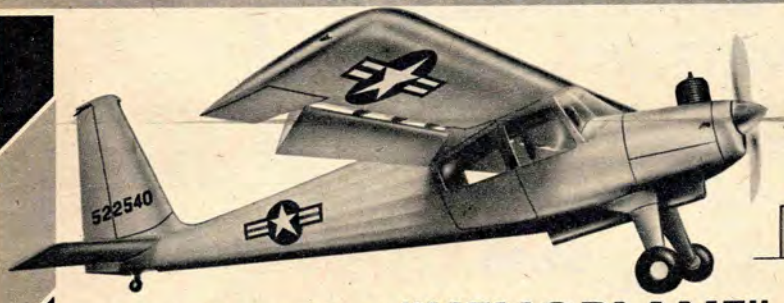

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Variable Camber Wing for Two-Speed Radio Control Flying!

Here is the model designed to use radio control devices that will be available in the next few years. The Helioplane is the first model that permits the use of the scale flaps giving true two-speed flight.

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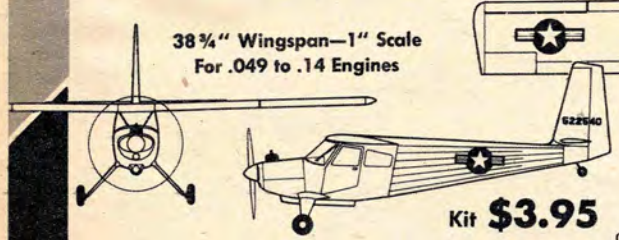

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With a large prop and full span flaps, the full-scale "Helioplane" can take-off with full load in 300 feet, maintain level flight at 30 m.p.h. Top speed is 150 m.p.h. Perfect for model work, you will hear more about this amazing airplane in the days to come.

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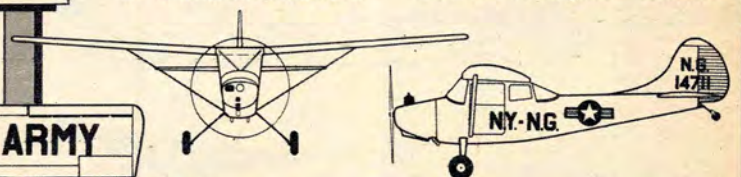
For 1 — Free-Flight "½A" Gas Power — 36" Wingspan—1" Scale
2 — Free-Flight Rubber Power — .035 to .049 Engines—Free-Flight
3 — Control-Line Gas Power — .049 to .099 Engines—Controline



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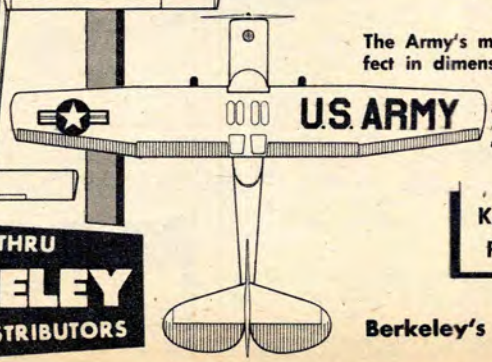

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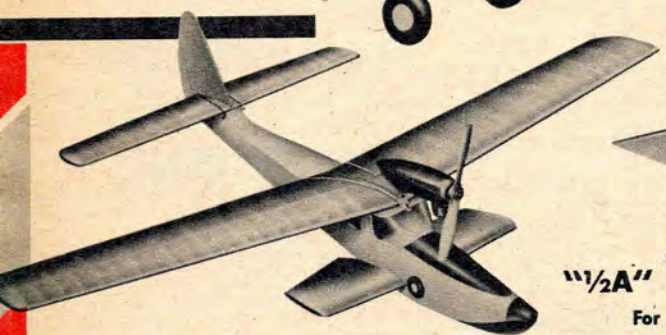

Hydro flying hints are described in detail on the plans.

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For .035 to .074 Engines—36" Wingspan

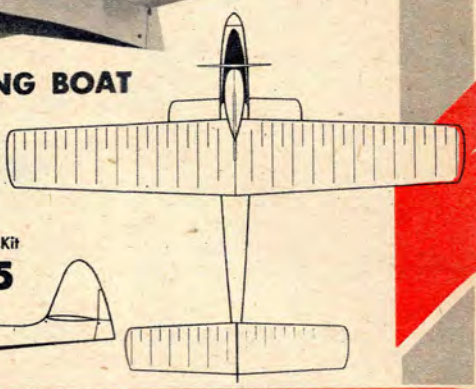
With N.A.C.A. Plotted "Long Planing Hull"

Long Planing Hull design is revolutionary in seaplane performance. Smooth, effortless take-off in less than fifteen feet. Buoyant sponsons hold model upright in wind and waves.

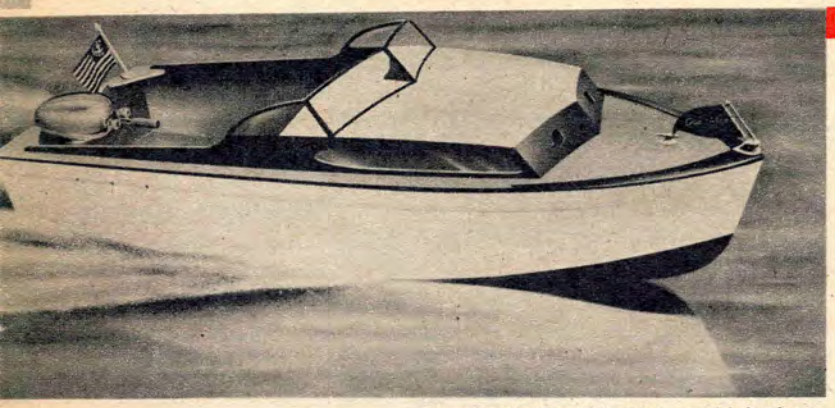
The Newest in Flying Boats...

Hull is built-up pre-fabricated sheet balsa construction with no complex curves to bend. Fuselage, sponsons, wing and stabilizer are of self-draining design. Die cut celluloid windshield, die cut balsa parts. METAL MOTOR MOUNT AND NACELLE.

Extensively tested on open water, it has proven itself practically crashproof. Hydro flying hints are described in detail on the plans.



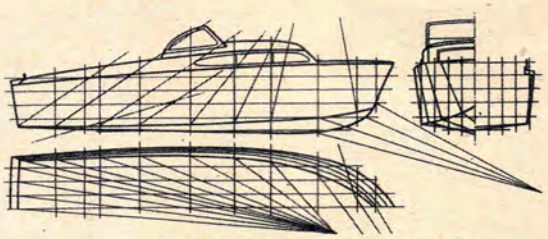
Pre-fabricated Kit **$2.95**



Chris-Craft Pre-Fabricated "OUTBOARD EXPRESS CRUISER"

For Electric Outboard & Inboard Engines

18" Long— 1" Scale **Kit $2.95**



The ideal kit for the new model electric outboard motors, or an electric inboard motor. Designed from factory plans, authentic down to the special "Chris-Craft" decals.

Designed by the Intersecting Conical Lofting Method. Mahogany Veneer construction is used throughout. All wood parts are accurately Die-Cut to shape, and need only be assembled.

The Latest in Model Boats...

Berkeley Catalog—25¢

If no local dealer is convenient, mail orders will be filled by Berkeley Model Supplies, Dept. AT., West Hempstead, N. Y. Please include 25¢ packing & postage.

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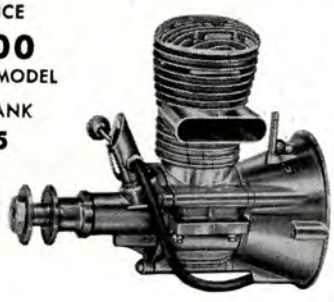

We Will Continue to Make Our Famous Atwood Triumph '49's and '51's

The '51 holds the Official World's Speed Record for 100 meters. These are available, however, only in limited quantities.

LIST PRICE
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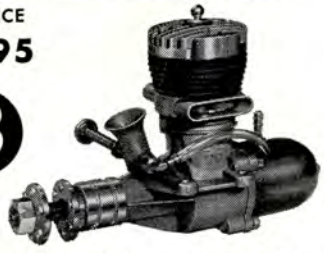

We Will Continue to Import The Sensational Japanese OS "29"

—because of its superiority in the field. Develops ½ HP at 15,000 rpm's. A quality engine throughout. (Watch for the new .099 and .36 models to be introduced at the 1953 M. I. A. Trade Show.)

"An Atwood Engine Will Never Let You Down"

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After His 20 Years of Designing and Manufacturing Trophy Winning Model Airplane Engines—Based on a Keen Personal Interest in Competitive Flying—We are Pleased to Announce—

THE NEW 1953

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Atwood .049

F/F—$5.75
U/C—$5.50
U/C COVER 35¢
INVERTED TANK 65¢

- **A More Powerful ½ A Engine that's Really Hot!**
- **An Engine More Adaptable to a Hobbyist's Needs**
- **An Engine With New, Different, Improved Timing—Larger Crankshaft and By-Pass Area**
- **Bore .420—Stroke .360—Develops up to 18,000 rpm's with Standard ½ A Props**

4 ***This Is Our NEW FACTORY***

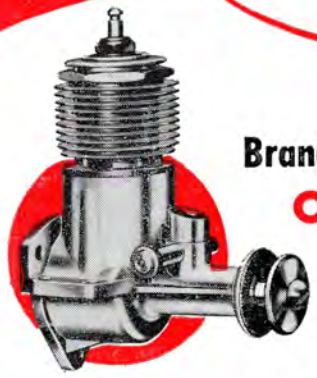
Where Atwood engines will be manufactured in the future. It's a modern, pleasant, well-lighted plant in Montrose, California...which you are invited to visit when in the vicinity.

5 ***OUR NEW NAME*** Combining our manufacturing and importing activities, will be

ATWOOD MOTORS

3716 Park Place, Montrose, Calif.

OK ...Bears Down on Price! ...Ups Power and Performance!



Brand New Class A Displacement!

OK CUB .14

Requested by leading plane designers. Light — only 2¾ oz. Souped-up power — 3,000 to 15,000 RPM. For free flight, U-control and R/C flying.
For free flight, U-control and R/C flying. **$8.95**

Top Performer in ½A Class!

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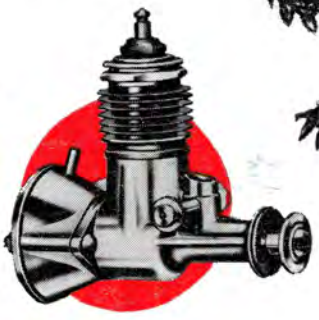
Combination Package

Companion to the famous .049 Cub. Shorter stroke and larger bore deliver higher output. Package includes assembled engine, matched prop, extra rear cover, fuel tank, neoprene tubing. **$6.25** Complete



Complete Power Plants at Low, Low Prices!

OK CUB Combination Packages

Get an OK Cub Combination Package in any of 4 displacements and enjoy the best in value, power and performance. Each package contains assembled engine, prop and fuel tank.

CUB .039 . . .	$4.95	CUB .074 . . .	$6.75
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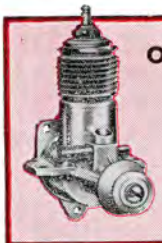
OK .049 Power Kit

A $6.15 value — assemble it yourself and save $1.20!

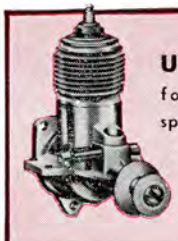
$4.95



Outstanding ½-A

Beginner's choice — rugged — easy to start.

OK .049 CUB $5.25



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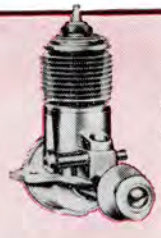
OK .074 CUB $5.95



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For Championship Performance!

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Quicker Starting, Faster Accelerating!

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